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Arizona Ranch, Farm, and Garden Weeds

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Introduction

Economic losses from weeds are of growing concern to Arizona farmers and ranchers. Weeds decrease farm income by robbing the soil of precious moisture that would otherwise be available for crop production, by utilizing soil nutrients needed by cultivated plants, by decreasing the quality of farm products because of weed impurities, and by increasing the cost of labor, equipment and irrigation.

Also many weeds harbor some of the worst crop insect pests and are alternate hosts to organisms causing crop diseases. Some weeds are parasites on useful plants.

On rangelands, weeds may seriously decrease grazing capacity for livestock by competing with the good forage plants for moisture and nutrients. Other undesirable range plants may be poisonous, causing reduced weight gains, lowered animal production or even actual death.

Some range weeds are troublesome to domestic livestock because of their thorns, barbs, stiff hairs, or sharp pointed seeds. Such may cause mechanical injury to the eyes, mouth parts and intestines, and to the skin and the hide. They may lower the value of wool or mohair and otherwise cause wounds that invite attack from screwworms.

Weeds in the garden dampen the home owner's interest in improving and maintaining gardens that beautify the home and make the community attractive and livable. Weeds, too, may raise the home owner's costs for water and fertilizer.

Kinds of Weeds

A weed is any plant that grows out of place or is unwanted because of certain undesirable characteristics.

A plant, although useful in some places, may become a weed if growing where not wanted. Bermuda grass is excellent as a summer lawn but a pernicious weed in a flower bed or on farm land or ditch banks. Even in lawns, Bermuda grass may be a weed and undesirable to people afflicted with hay fever.

Plants that come in to cultivated crops, lawns and gardens; that invade and increase on range lands particularly where the cover of choice perennial grasses is too thin to offer competition; and that become established on disturbed soil along roadsides, railroads, power line right-of-ways and waste places
are weeds. Such plants include grasses, broadleaved herbs, shrubs and even trees.

Most of the worst field and lawn weeds in Arizona, such as Johnson grass, puncture vine, Russian thistle, London rocket, knotweed, field bindweed, and wild oats have been introduced into the United States from the Old World countries. Some, as sandbur, crownbeard, horseweed, sunflower, and alkali heliotrope have been introduced here from other parts of the United States. A few native plants, as careless weed, white horse nettle, slim leaf bursage, scale grass, blueweed, and sprangletop, have spread from adjacent mesas or valleys to become established pests.

Range weeds are mostly native plants of low forage value. Opportunity for their increase comes about through overgrazing, drought and other disturbing influences particularly detrimental to the good forage plants. Junipers, mesquite, burroweed, snakeweed, and cholla are examples of such native invaders.

Poisonous range plants are another type of weed. Poisonous weeds contain some specific substance which, when eaten in sufficient quantity or at certain periods of physiological change in the plant may produce illness or death in livestock. Some plants that ordinarily provide good forage, as pata or careless weed, apparently change nitrates to nitrates under certain growing conditions and become extremely poisonous, even in small quantities.

Johnson grass and white thorn may produce poisonous hydrocyanic acid when growth is interrupted, as by frost or drought, and then resumed. In other poisonous plants, as in the loco weeds, the toxic substance is cumulative and is relative to the amount of the plant eaten. Certain species of loco weeds, mustards, aster, and some other plants, absorb selenium when grown on soil bearing that element, and cause selenium poisoning in animals (not common in Arizona).

Some plants are more poisonous when young, as the larkspurs. Others like the upines are more dangerous in seed. Still others such as whorled milkweed are poisonous either green or dry as in hay. Some weeds are poisonous to all kinds of livestock while others affect only certain kinds of animals. Thus, pin gue, lupine and sneezeweed are harmful chiefly to sheep, larkspur mainly to cattle, loco principally to horses and cocklebur seedlings largely to young pigs and hogs.

Classification of Weeds

Grouped according to their habits of growth and reproduction, there are three principal classes of weeds:

Annuals

Annuals live one year or less. They flower, produce seed, and then die down entirely. Annuals and biennials are dependent upon seed alone for reproduction and are usually prolific seeders.

There are two general types of annuals: Summer (or true annuals) and winter annuals. The seed of Summer annuals germinate in the spring, mature and produce seeds during the summer, and die in the fall or winter.

Winter annuals germinate in late summer or fall and live through
the winter as a small rosette of leaves. In the spring they mature rapidly and produce flowers and seeds. In central and southern Arizona such annuals as London rocket, shepherd’s purse, rescue brome, bur and sour-clover, sow thistle, and many others, grow luxuriantly during the short, mild winters.

**Biennials**

Biennials live two years. The seeds germinate in the spring and pass the summer in a rosette form. The next spring and summer the plants grow vigorously, mature, and die.

There are very few biennial weeds in Arizona. Cheeseweed and sweet clover are true biennials. Some weeds, annuals in colder parts of the country, become biennial in habit in Arizona.

**Perennials**

Perennial weeds live more than two years and are the most pernicious. According to their reproduction habits, there are three general types of perennials: simple perennials, creeping perennials, and bulbous perennials.

- **Simple perennials** have perennial root crowns, with fleshy taproots like the dandelion, or with fibrous roots as in the case of the bunch grasses. These are principally dependent upon seed for reproduction except when the roots happen to be broken into pieces.

- **Creeping perennials** possess, in addition to their true roots which often grow very deep in the soil, horizontal rhizomes or “rootstocks”. These arise from the lower stem joints and are true stems, not roots. If these horizontal or creeping stems occur above ground, they are called stolons or runners; below the ground they become rhizomes or “rootstocks”. These weeds are the most difficult of all to eradicate and many “noxious” weeds are of this type. Bermuda grass, Johnson grass, and hoary cress are excellent examples.

- **Bulbous perennials** which reproduce by means of bulbs, bulblets, or tubers are rare among Arizona weeds. Yellow and purple nutgrass reproduce by runners and rhizomes and also by means of small underground storage tubers, called nutlets.

**Identification of Weeds**

The major purpose of this circular is to assist you as a farmer, rancher, gardener or agricultural student to recognize the most common or troublesome weeds of the state. Most Arizona weeds may be identified by comparison with the drawings and checking against the plant description, or if known, by looking up the common names in the index, and referring to the text.

A weed that cannot be identified or is not described in the bulletin should be collected and sent to the Department of Botany, University of Arizona, Tucson, for free identification. It is possible it may be new and a potential pest.

The specimen is best pressed and dried between a folded newspaper. If possible it should include all parts—roots, stems, leaves, flowers and fruits.
FERN FAMILY

Polypodiaceae

BRACKEN FERN

Pteridium aquilinum (L.) Kuhn. var. pubescens Underw.

A. Leaf from underground stem
B. Back of fruiting leaflet

OTHER COMMON NAMES—Western bracken, lady bracken, hog bracken, hog brake, common brake, adderspit, eagle fern, brake fern.

DESCRIPTION—Bracken fern is perennial, reproducing by deep-spreading, dark brown underground stems and also spores. One large coarse triangular leaf (frond), 1 to 4 feet long and 1 to 3 feet broad, is the only part of the plant above the ground. The leaf is not evergreen and dies down in the fall, a new one appearing each spring. It is divided into large divisions which are again divided and may be redivided once again.

At certain times of the year, many small brown spore cases (fruiting bodies) are borne on the under side, hidden by the inrolled leaf margins. The long, slender straw-colored leaf stalk is usually mistaken for the stem but actually is attached to the true stem under the ground.

DISTRIBUTION—Bracken fern is common in moist to dryish soil in open yellow pine and aspen forests or in meadows in the mountains of Apache, Navajo, and Coconino counties, at 5,000 to 8,500 feet elevation.

POISONOUS PROPERTIES — The leaves are poisonous to cattle and horses but livestock ordinarily does not eat them except in hay. They are equally toxic in the green or dry state and at all times of the year. The exact nature of the poison is unknown, but its action is slow and cumulative. Several weeks and considerable amounts are required before its effects are shown in the animal.

Bracken fern does not occur in dense enough stands in this state to pose a problem on rangelands or in hay.
Evergreen trees or shrubs with short, overlapping, sharp-pointed leaves covering the stems, and green berrylike cones, reproducing by seed or stump sprouts. Junipers have spread so alarmingly onto central and northern Arizona range-lands as to constitute both major range and water-shed problems. They have taken over large grassland areas north of Prescott, along the Mogollon Rim, and Apache Indian Reservation.

**Utah Juniper**

*Juniperus osteoperma* (Torr.) Little

OTHER COMMON NAMES—bigberry juniper, western juniper.

Utah juniper usually is a small rounded tree 10 to 15 feet high with a single trunk or if the trunk branches, the branches arise several feet above the ground. The berries contain 1 or 2 seeds and occur on the same trees as the pollen, thus on all trees.

Utah juniper, the most abundant in Arizona, grows in pure stands or with pinyon or one-seed juniper below the yellow pines. It is widespread north of the Gila River, 3,000 to 7,500 feet elevation.

**One-Seed Juniper**

*Juniperus monosperma* (Engelm.) Sarg.

OTHER COMMON NAMES—cherry-stone juniper, redberry juniper, West Texas juniper.

One-seed juniper usually is shrubby, 10 to 25 feet high with several curved limbs arising from the ground, and only rarely a tree with a single trunk. Like Utah juniper the bark is stringy and the berries contain 1 or 2 seeds but here the berries are juicy and do not occur on the same trees as the pollen.

One-seed juniper occurs in pure stands (i.e. east of Flagstaff) or more often with Utah juniper. It is common in the desert grassland and pinyon-juniper ranges throughout the state except in the extreme western and northeastern parts, 3,000 to 7,000 feet elevation.
OTHER COMMON NAMES—checkered-bark juniper, western juniper, cedro chino.

Alligator juniper, the largest in Arizona, is a tree 20 to 40 or sometimes 65 feet high with a trunk 1 or 3 or rarely 7 feet in diameter. It often stump sprouts. The bark is thick, dark gray and becomes deeply checkered. The berries contain 3 to 4 seeds.

Alligator juniper is common in oak or pinyon-juniper woodlands and lower yellow pine forests of southeastern and central Arizona. It grows mostly in scattered rather than in pure stands and extends north to above Flagstaff and west to the Baboquivari Mountains, 4,200 to 8,000 feet elevation.
GRASS FAMILY
Gramineae

RESCUE BROME
Bromus catharticus Vahl.

DESCRIPTION — Rescue brome is annual, a winter annual, or biennial, ½ to 3 feet high, reproducing only by seeds. It has thin flattish leaves, ½ to ½ inch broad. The flowering part is branched and up to 8 inches long. The flower groups (spikelets) are large, ¾ to 1 ½ inch long, strongly flattened and composed of 6 to 12 sharply folded, overlapping flowering bracts, which may or may not end in a stiff bristle. The grain is about ¾ inch long.

DISTRIBUTION — A native of South America, rescue brome is principally a weed in lawns, gardens, roadsides, ditchbanks, and small grain winter crops. Found in all counties, from 140 feet at Yuma to over 7,000 feet elevation on the Kaibab plateau, it is locally abundant around Tucson and rapidly increasing throughout southern Arizona; flowering from late February to September (higher altitudes) it, like the bromes below, disappears during hot weather.

Red Brome
Bromus rubens L.

OTHER COMMON NAMES — foxtail brome, foxtail chess.

A spring annual, ½ to 1½ feet high with the flowering part erect, short, only 1½ to 3½ inches long and crowded. The flowering groups (spikelets), about 1 inch long, have 4 to 11 flowering bracts, each ending in a reddish brown bristle about ¾ inch long.

Red brome is troublesome, principally on overgrazed rangelands in central Arizona where it has spread rapidly, uncommon southward and northward, 1,300 to 5,500 feet elevation; flowering March to June. The mature bristles are mechanically injurious to the eyes, mouths, and wool of animals.

Downy Chess
Bromus tectorum L.

OTHER COMMON NAMES — cheatgrass brome, downy brome, slender chess.

Weak, tufted annuals with very hairy leaves. The flowering part, 2 to 6 inches long, is soft, drooping, often purplish, with the flower groups nodding on threadlike stalks and the bristles ¾ to ¾ inch long.

Downy chess, like red brome, is an European introduction that is primarily a weed on run-down ranges, but in northern Arizona, 4,800 to 8,500 feet elevation; flowering May to July.
GRASS FAMILY

Gramineae

ANNUAL BLUEGRASS

Poa annua L.

A. Plant with inflorescence
B. Spikelet
C. Grain

OTHER COMMON NAME — walkgrass.

DESCRIPTION—A low spreading annual reproducing only by seeds. The tufted stems, often bent and rooting at the base, are 4 to 12 inches high. The bright green leaf blades are about 3 inches long. The flowering part is short, only 1 to 4 inches long with spreading branches and rather few flowering groups (spikelets). The bright amber grain is pointed at both ends.

DISTRIBUTION—Annual bluegrass is found in many moist places but is primarily a nuisance in lawns where it may grow very luxuriantly covering large areas, for a very short period in the winter and spring then dies out leaving ugly patches. This European introduction occurs throughout most of the state, from zero to 8,000 feet elevation; flowering from March to September (higher altitudes).
GRASS FAMILY

Gramineae

STINKGRASS

Eragrostis cilianensis (All.) Link.

OTHER COMMON NAMES—snakegrass, candygrass, Linkgrass, strong-scented lovegrass, skunkgrass, matrimony grass.

DESCRIPTION — Stinkgrass is an annual, branching from the base, ½ to 2 feet long, and reproducing only by seed. The stems are often prostrate then ascending, with minute glandular pits in a ring below the joints, or these scattered on the leaves, flower stalks, and the margins of the flowering bracts. They supposedly give off a cockroach-like odor that is offensive to livestock.

The flowering part of the plant is 2 to 10 inches long and widely spreading. The flower groups (spikelets) are densely crowded, ¾ to ¾ inches long with 12 to 40 flowering bracts. The reddish-brown, oval grains are only about 1/16 inch long and pointed at both ends.

DISTRIBUTION—A very common weed from early summer through fall in cultivated crops, gardens, roadsides and waste places, especially heavy soiled drainage lands, throughout most of the state except the northeast part, from 100 to 6,000 feet elevation; flowering from June to October. Seeds of this European weed often occur as an impurity in small commercial seeds, as alfalfa.

POISONOUS PROPERTIES — Livestock (horses) are reported to have been poisoned by eating large quantities of the fresh or dried plant over a period of time, but none in Arizona.
GRASS FAMILY

Gramineae

DESERT SALTGRASS

Distichlis stricta (Torr.) Rydb.

A. Plant showing underground stem
B. Spikelet
C. Flower

OTHER COMMON NAMES—inland saltgrass, seashore saltgrass, marsh spikegrass, saltgrass.

DESCRIPTION — Desert saltgrass is a low, stiff perennial, 4 to 16 inches high, reproducing by seed and by means of tough, extensively creeping, scaly rootstocks. These root at the joints and produce new stems, often forming dense colonies. The lower part of the hard rigid stems usually lies on the ground then becomes erect.

The narrow leaves are alternate but come off from the stem in 2 rows. They are ½ to 4 inches long, and about ¼ inch broad, sometimes folded lengthwise or the edges rolled inward. The flowering part of the plant at the top of the stem is yellowish, short, and narrow. Although all the plants look alike, including their flowering groups (spikelets), there are actually 2 kinds of saltgrass plants, male and female.

Each flower group (spikelet) contains 5 to 10 bractlike flowers. Those on the male plants bear stamens only and the female only pistils. The grain remains enclosed in a pointed, greenish or purplish hull.

DISTRIBUTION—A native weed in moist to dryish mostly alkaline soil, or sometimes on sandy, or heavy bottomland soil. Common on the Little Colorado and Salt River Valley drainage flood plains and marshes in the desert and northern desert, in Apache, Navajo, Coconino counties and southward, 100 to 6,000 (rarely higher) feet elevation; flowering from May to October.

From its native habitat, saltgrass has spread to the irrigated lands and become a noxious weed in ditches, cotton fields and other crops, as in the Yuma and Moencopi (Navajo County) areas.
GRASS FAMILY
Gramineae

COMMON FOXTAIL
_Hordeum leporinum_ Link, _H. murinum_ of authors

A. Plant with inflorescences
B. Spikelet

OTHER COMMON NAMES—mouse barley, farmer's foxtail, wild barley.

DESCRIPTION — A many branched, spreading, or nearly prostrate annual, 6 to 20 inches high, reproducing by seed The broad, flat leaf blades are 1½ to 4 inches long. The thick erect flowering spike is 2 to 3 inches long and usually partially enclosed by the uppermost expanded leaf sheath. It breaks apart when it is mature. The stout, stiff bristles are ¾ to 1½ inches long. The yellow grain is about ¼ inch long and hairy at the top.

DISTRIBUTION — Introduced from Europe, common foxtail is a weed pest starting early in the spring in cultivated crops, especially grain and alfalfa fields. It is common on disturbed soil of roadsides, irrigation ditches, vacant lots, and lawns throughout Arizona, except the northeastern part, 100 to 9,000 feet elevation; flowering mostly in March and April at lower altitudes and to October at higher elevations.

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Foxtail Barley
_Hordeum jubatum_ L

OTHER COMMON NAMES—fuckertail, skunktail, ticklegrass, wild barley.

DESCRIPTION — Foxtail barley is a tufted perennial, often appearing annual, 1 to 2 feet high, reproducing by seeds and also by inconspicuous rootstocks. It is similar to common foxtail but larger, the flowering spikes, 2 to 4 inches long, are nodding, not erect, the pale green or reddish bristles are much longer, ¾ to 3½ inch long, and finer, not as stiff. The flower heads are only about 1 inch broad until maturity then they spread and are very bushy as in squirreltail (_Sitanion hystrix_) except the bristles are much finer and not stiff.

DISTRIBUTION — A native weed of moist soil on disturbed ground along streams, lakes, roadsides, and especially troublesome in irrigated pastures and ditches (but not usually in cultivated fields) in Apache, Navajo, Coconino, and Maricopa counties, 5,000 to 7,500 feet elevation; flowering June to September.
OTHER COMMON NAMES— oatgrass, wheat oats, flaxgrass

DESCRIPTION—Wild oats is a stout annual, 1 to 4 feet high, with a large root system, and reproduces by seed. The leaf blades, 3 to 8 inches long, and about ¼ to ½ inch broad, are thin and rough. The flowering part is large and spreading.

Each flower group (spikelet) is about 1 inch long (without the bristle), and has 2 to 4 flowering bracts. These bracts have reddish-brown hairs at the base and, arising from the center back of each is a dark, stout, 1¼ to 1½ inch long bristle. The bristle is bent sharply near the center and the lower part twisted tightly.

The yellowish grain is silky, hairy, and about ½ inch long.

DISTRIBUTION — Wild oats is one of the most troublesome winter crop pests in the state. It has been estimated that every small grain-field in the Salt River Valley varies in content from 1 percent to 75 percent of wild oats.

It is also an uncommon weed in disturbed soil, and waste places throughout most of the state, up to 8,250 feet.

Cultivated Oats

*Avena sativa* L.

Cultivated oats and its varieties closely resemble wild oats but the base of the flowering bracts is not hairy and if a bristle is present, it is shorter and straight, not bent in the center.
GRASS FAMILY
Gramineae

BERMUDA GRASS
Cynodon dactylon (L.) pers.

A. Plant showing underground stem
B. Inflorescence
C. Flower
D. Grain

OTHER COMMON NAMES—devilgrass, scutchgrass, dogtooth grass, vinegress, wiregrass.

DESCRIPTION—A wiry, spreading perennial, reproducing by seeds but mostly by means of long runners on top of the ground and a vast system of hard, sharp-pointed rootstocks beneath the ground which may be shallow or very deep. The leaves on the erect stems are 1 to 4 inches long, those on the runners and rootstocks are very short, scaly, and not leaflike.

Roots are formed at the joints and frequent erect, flowering stalks are produced, about 4 to 18 inches high. These have 3 to 5 very narrow fingerlike flowering spikes at the tip.

The tiny stalkless flower groups (spikelets) slightly overlap one another and are arranged in 2 rows on just 1 side of the spike stem. The tiny, oval grain is orange red, reddish brown or straw colored.

DISTRIBUTION — Bermuda grass is one of the most pernicious weeds throughout the state and is very alkali resistant. It grows almost any place in cities and road-sides, wherever there is moisture, and even occurs in sandy washes of out-of-the-way canyons, usually below 6,000 feet elevation; flowering at regular intervals except during the winter when it dies down.

This troublesome weed is very hard to eradicate when it becomes established in flower beds and fields, and its pollen is probably the most serious source of hay fever in the state. However, it is the most common summer lawn grass in southern Arizona. It cannot stand freezing temperatures, nor shade, nor frequent cultivation but can tolerate indefinite periods of drought. Around Yuma, large fields are grown as seed crops.
DESCRIPTION—Feather fingergrass is a weak, slender, erect or spreading annual, ½ to over 3 feet high, with a shallow root system, and reproduces by seeds. The leaf blades are weak, ¾ to 3 inches long, with the upper leaf bases enlarged and enclosing the flowering part until it opens.

The flowering part consists of about 2 to 10 tawny, narrowly featherlike, soft flowering spikes, ¾ to 3½ inches long, arising together at the stem tips. Each flower group (spikelet) has a tuft of long soft hairs at the top and very slender bristles ¼ to ½ inch long. The little spikelets are crowded and arranged in 2 rows along 1 side of the spike stem.

DISTRIBUTION — This South American weed is very common on bare, disturbed soil throughout Arizona, in waste places, roadsides, desert washes, and swales, up to 5,500 feet elevation; flowering April to November. It has spread rapidly to the irrigated fields and is now so abundant in cultivated crops most of the year as to be a pest in many areas.

Windmill Grass
Chloris verticillata Nutt.

Closely related to feather fingergrass but a low perennial. The flowering spikes are longer (3 to 6 inches long), stiff and outward spreading. They arise from 3 or more levels near the top of the stem, and are not feathery. This Texan weed has become established in the Yuma mesa in the citrus orchards.
Grass Family

Gramineae

Red Sprangletop

Leptochloa filiformis Lam. Beauv.

DESCRIPTION—Tall or spreading weak annuals, 4 inches to 4 feet high, often reddish or purplish. The leaf blades are thin and flat and the sheaths bear long slender hairs. The mature flowering tops are extremely variable in length but are about 1/2 to 1/2 the length of the stems and may be 11/2 feet long. The very slender branches are 1 to 5 inches long and spreading at maturity. The tiny spikelets less than 1/8 inch long are not awned.

Distribution—Red Sprangletop is a common weed of roadsides, citrus orchards, ditchbanks, cotton and alfalfa fields, gardens, sandy washes, and dry slopes throughout Arizona, except Navajo, Mohave counties, 100 to 5,000 feet elevation; flowering June to October.

Scale Grass

Leptochloa fascicularis (Lam.) Gray

OTHER COMMON NAMES—bearded sprangletop, spreading millet, raygrass.

DESCRIPTION—Coarse, succulent annual, forming rather large clumps or sometimes dwarfs and only 4 to 6 inches high. The leaf blades are narrow and flat or involuted, tubelike and are a bluish-green color.

Distribution—Scalegrass is a weed of wet places and often alkaline soil, in irrigated crops, along ditches, streams, reservoirs, roadside swales, and brackish water along lakes and rivers in Navajo, Graham, Gila, Pinal, Cochise, and Pima counties; 1,500 to 5,000 feet elevation; flowering June to October.
GRASS FAMILY
Gramineae
MEXICAN SPRANGLETOP
Leptochloa uninervia (Presl.) Hitch. Chase

A. Plant and inflorescence
B. Spikelet
C. Grain

Very similar to scalegrass but the mature spikelets are more than ¼ inch long and darkly lead colored. Mexican sprangletop grows in the same type of wet places as scalegrass and is found in Mohave, Pinal, Maricopa, Yuma, and Pima counties; 400 to 3,500 feet elevation; flowering June to October.

This weed is particularly troublesome in the fall in winter barley fields since it germinates sooner than the barley grains. In the spring it is a great pest in cantaloup crops.
GRASS FAMILY
Gramineae

SANDBUR
Cenchrus echinatus L.

A. Plant with inflorescence
B. Inflorescence
C. Spikelets of C. echinatus
D. Spikelets of C. pauciflorus

OTHER COMMON NAMES—
burgrass, cockspur, southern sandbur.

DESCRIPTION—Sandbur closely resembles field sandbur, but the burs are reddish, mostly broader than long and are broadest at the base. (Those of field sandbur are broadest near the center). These have a definite ring of many short, straight bristles at the base. (Those of field sandbur often have a few, curved bristles at the base). Each bur usually contains 4 seeds.

DISTRIBUTION — Sandbur is not as widespread throughout the state as field sandbur but it is probably the most noxious weed in the late summer crops, orchards and alfalfa fields in the Yuma, Salt River, and Santa Cruz valleys, 100 to 4,000 feet elevation; flowering May to October.

Field Sandbur
Cenchrus pauciflorus Benth

OTHER COMMON NAMES—sandbur, burgrass, hedgehog grass, sandspur.

DESCRIPTION — An erect or spreading annual, or sometimes a short-lived perennial, reproduced by seeds and by prostrate stems rooting at the lower nodes, sometimes forming mats, then ascending, 4 inches to 3 feet long, with a shallow root system. The leaf blades are usually flat, twisted or folded, and 2 to 5 inches long.

The flowering spikes are 1½ to 4 inches long, often partially enclosed by the upper leaf sheath, and are composed mostly of 3 to 15 burs, loosely arranged, but may have 20 to 30 burs and be very tightly congested.

The spiny, hairy yellowish burs are about ½ inch long, and mostly longer than broad. The numerous flattened spreading rigid spines, ¼ to ¾ inch long often have a few, curved bristles at the base. Each bur usually contains 2 seeds. There may be as many as 1,000 seeds produced by a single plant.

DISTRIBUTION—Field sandbur is a very troublesome weed when the vicious burs mature. These injure clothing as well as skin. It is found mostly in dry sandy soil in cultivated fields, roadsides, lawns, washes, and waste places, throughout the state, 100 to 6,000 feet elevation; flowering May to October.
GRASS FAMILY

Gramineae

LITTLESEED CANARYGRASS

Phalaris minor Retz.

A. Plant with inflorescence
B. Flower and grain

OTHER COMMON NAMES—Mediterranean canarygrass.

DESCRIPTION—An erect, bluish green annual. The stems are weak, slightly bent at the base and branching, 1 to 2 (or more) feet high, reproducing only by seeds. The leaves are flat or folded, ¼ to ½ inch broad. The flowering part is 1 short, thick, oblong-egg-shaped, spikelike head at the top of each stem, ¾ to 2 inches long. The flower groups (spikelets), are densely crowded and overlapping on the heads. The 2 broad outer bracts (glumes), are sharp-pointed, noticeably flattened and sharply folded, the upper half of the fold with a narrow papery wing. They are ¼ to ½ inch long, pale with a darker green stripe on each side at the base of the wing. The shiny, straw colored grain is hairy, egg-shaped, narrow and pointed at the tip, and about ¼ inch long.

DISTRIBUTION — A native of the Mediterranean, littleseed canarygrass is a troublesome weed in moist soil in the cotton and other cultivated fields, irrigation ditches, reservoirs, bottomlands, and road-sides in southern and central Arizona, 150 to 3,500 feet elevation;

Carolina Canarygrass

Phalaris caroliniana Walt.

DESCRIPTION—Plants of Carolina canarygrass cannot be distinguished from littleseed canarygrass unless the flowers are examined. The flowering head is oblong, and may be 3 inches long in this grass, and the green stripes on the outer bracts are not conspicuous. The best character is in the grain, but requires the aid of a lens. At the base of the grain on one side there is 1 tiny scale in littleseed canarygrass, whereas there are 2 scales, 1 on each side, and more conspicuous in Carolina canarygrass; also the grains are longer, slightly more than ¼ inch (4mm.) long.

DISTRIBUTION — Although more widely distributed throughout central and southern Arizona and very common in the same type of places as littleseed canarygrass, it apparently is not so concentrated in the agricultural fields, and thus not as troublesome, 150 to 6,000 feet elevation; flowering mostly in April and May but sometimes February to August.
GRASS FAMILY

Gramineae

CRABGRASS

Digitaria sanguinalis (L.) Scop.

OTHER COMMON NAME—hairy crabgrass.

DESCRIPTION—A weak summer annual, much branched, reproduced by seeds and by stems spreading at the base and rooting at the lower joints. The flat leaf blades, ¼ to ½ inch broad, and the sheaths are very hairy, with long stiff hairs.

The flowering part is made up of 3 to 11 slender, fingerlike branches, 2 to 6 inches long which may all arise from the same point at the stem tip (as in bermuda grass) but usually several branches in addition arise a short distance below the tip. The small flowering groups (spikelets), ¼ to ⅛ inch long, lie very close to the branch stems and come from only 1 side. The light yellow oval grain is about 1/12 inch long.

DISTRIBUTION—Crabgrass, introduced from Europe, is a weed of moist soil. It is particularly obnoxious in lawns (where it forms coarse basal rosettes of leaves) but also is very common in cultivated fields, along streams, ditch banks, roadsides, and washes in southern and central Arizona, uncommon northward except in certain local areas, 100 to 6,000 feet elevation; flowering June to October.

Smooth Crabgrass

Digitaria ischaemum (Schreb.) Muhl.

OTHER COMMON NAME—Small crabgrass.

DESCRIPTION—Similar to crabgrass but smaller and not hairy. The bract enclosing the grain is blackish brown rather than pale yellow. A recent arrival in the bermuda lawns of southern Arizona and spreading rapidly. On the University of Arizona campus smooth crabgrass was found in nearly pure stands occupying areas up to 30 feet or more in diameter.
GRASS FAMILY
Gramineae

RABBITFOOT GRASS
Polypogon monspeliensis (L.) Desf.

A. Plant
B. Spikelet

OTHER COMMON NAMES—beardgrass, tawny beardgrass, annual beardgrass.

DESCRIPTION — A yellowish green annual, ½ to 2 feet high with the stems often sharply bent and spreading at the lower joints, reproducing only by seeds. The flowering part is a soft, silky spike, 1 to 4 (sometimes 6) inches long, with delicate glistening, yellowish or tawny bristles. The flowering top is so dense it appears to be unbranched but the innumerable, tiny flower groups (spikelets), about 1/12 inch long, are actually crowded on little short branches.

The 2 outer bracts in each spikelet end in a slender bristle about ¼ to ⅛ inch long. These give the flower head its bristly appearance. The plump grain is amber colored about 1/12 inch long.

DISTRIBUTION — A European weed, rabbitfoot grass is found in moist soil throughout most of the state, and is very common in irrigated areas in cultivated fields, pastures, and ditches. It also occurs in river bottoms, swales, along roadsides, streams and in mountain canyons, 100 to 8,200 feet elevation; flowering March to October.

Ditch Polypogon
Polypogon interruptus H.B.K.

A tufted perennial, but very similar to rabbitfoot grass and sometimes hard to distinguish. The flowering part is more spreading, with the branches obvious. It is much less spike-like in appearance. The bristles are shorter, about ⅛ inch long.

Ditch polypogon, also introduced from Europe, is found in the same habitats as rabbitfoot grass but is not as common, 150 to 7,500 feet elevation; flowering May to October.
GRASS FAMILY

Gramineae

SOUTHWESTERN CUPGRASS

Eriochloa gracilis (Fourn.) Hitchc.

A. Plant
B. Spikelet
C. Grain

DESCRIPTION—A spreading annual, 1 to 3 feet high, reproduces by seed and by the prostrate stems rooting at the nodes. Without the flowering tops, southwestern cupgrass is very similar to crabgrass. They may be distinguished, however, by the fact that the bright green leaves are not hairy in this grass.

The flowering part is hairy, 2 to 6 inches long, with short, erect to spreading branches about 1 to 2 inches long. The flowering groups (spikelets) are about 3/16 inch long, tapering into a point at the tip. Each spikelet has a cuplike (sometimes darkened) ring around the base. The yellowish, oval grain is flat on one side and rounded on the other, about 1/6 inch long with a short, sharp point at tip.

DISTRIBUTION — Southwestern cupgrass is a native and is one of the most common and troublesome weeds in summer lawns. It is very commonly mistaken for crabgrass. It also is abundant along roadsides, city streets, cultivated fields, streams, washes, canyons, ditches, and pools, throughout southern Arizona, 125 to 5,500 feet elevation; flowering June to October.

Canyon Cupgrass

Eriochloa lemmoni Vasey & Scribn.

DESCRIPTION—An annual ½ to 2, or 3 feet high. Similar to southwestern cupgrass, but the leaf blades are hairy. Frequently found on disturbed soil of roadsides, canyons, and washes in Cochise, Pima, and Santa Cruz counties, 2,400 to 5,700 feet elevation; flowering August to October.
DESCRIPTION—Dallisgrass is a tall perennial from a hard, knotty base, 1½ to 5 feet high, and reproduces only by seed. It has flat leaf blades about 2 to 6 inches long. The flowering part consists of 3 to 5 very narrow branches, 1 to 3 inches long, alternate along the upper part of the stem. These bear the flowering groups (spikelets) on one side only.

The small, pointed spikelets, about ⅛ inch long, are stalkless and lie in even rows close to the branch. The dark purple stigmas are often conspicuous. The smooth, shiny grain is yellowish, nearly circular and slightly less than ⅛ inch long.

DISTRIBUTION—Dallisgrass is a South American species, that grows in moist or marshy soil. As a weed it is primarily troublesome in lawns, but also occurs in alfalfa and other crops in southern Arizona—particularly in Pinal, Maricopa, and Pima counties. This grass is planted as a permanent pasture grass to some extent in southern Arizona and has been grown in Apache county, but less successfully. It flowers from April to November.

POISONOUS PROPERTIES—Although dallisgrass is good forage it is very susceptible to the fungus attacks of paspalum ergot (Claviceps paspali Stevens & Hall). The fungus produces a dark, sticky substance similar to axle grease, known as “honey dew”, which covers the grass flowers. Paspalum ergot is the only ergot poisoning reported in Arizona, and that only of cattle running in pastures containing dallisgrass.
GRASS FAMILY

Gramineae

BROWNTOP PANICUM

Panicum fasciculatum Swartz var. reticulatum (Torr.) Beal

A. Basal Portion of Plant
B. Inflorescence
C. Spikelets
D. Grains

DESCRIPTION — A tall annual, erect or spreading and branching from the lower stem joints, 1 to nearly 4 feet high, reproducing by seeds. The leaves are thinly hairy or hairless and ¼ to ½ inch broad. The flowering part is short, mostly 2 to 6 inches long with erect to slightly spreading, spike-like branches, 2 to 4 inches long.

The flower groups (spikelets) are green when young and yellow or bronze when ripe. They are hairless, less than ½ inch long and minutely cross ridged. The grain is dull, also minutely cross ridged and ¼ inch or less long, with the tip blunt.

DISTRIBUTION — Browntop panicum is a native weed, infrequent in Arizona in sandy washes, river bottoms, and waste places until a few years ago. It has now become very common and often a nuisance in cultivated crops (i.e. cotton) in the irrigated areas of southern Arizona, as the Salt and Gila rivers, Santa Cruz, Avra, and Yuma valleys, 100 to 3,500 feet elevation; flowering June to October.

Arizona Panicum

Panicum arizonicum Scribn. & Merr.

DESCRIPTION — Closely resembling browntop panicum but shorter, ½ to 2 feet high. The flower groups (spikelets) are about the same color but are short hairy, slightly longer than ½ inch and are not minutely cross ridged. The grains are short pointed.

DISTRIBUTION — Arizona panicum is a native weed of mesas, sandy washes, rocky slopes and canyons throughout southern Arizona, up to 5,000 feet, and also is a common farm weed found in the same general places and flowering at the same time as browntop panicum.
GRASS FAMILY

Gramineae

WITCHGRASS
Panicum capillare L.

A. Basal portion of plant
B. Inflorescence
C. Spikelet
D. Grains

OTHER COMMON NAMES—tickleglass, tumble panic, paniclegrass, old witchgrass, fool hay, tumbleweed grass, witches hair, mousseline.

DESCRIPTION—A bushy, conspicuously hairy annual with a shallow root, reproducing only by seeds. The stems are hairy, erect, or mostly spreading and much branched from the base, ½ to 3 feet high. The leaves are ¼ to ½ inch broad and are covered (especially the bases) by long, soft or stiff hairs.

The mature flowering part is very large and bushy, often half the length of the entire plant, greatly spreading and diffusely branched with the branches stiff and thread-like. It is brittle when ripe and often the entire flowering part breaks away and is blown about by the wind as a “tumbleweed”.

One flower group (spikelet) occurs at the tip of each little branch. They are 1/12 to ½ inch long. The yellowish or grayish grain is smooth and shiny, about 1/16 inch long.

DISTRIBUTION—Witchgrass is a native weed of dryish soil. Common along sandy canyon washes, streams, open ground and pastures, it has increased and spread in Arizona with the increase in agriculture.

It has become abundant in the irrigated lands, especially cotton and alfalfa fields, and also occurs in flower beds, gardens and waste places throughout most of the state, 100 to 8,000 feet elevation; flowering from May at lower elevations, or from July at higher elevations, to October. The grains are frequently found in commercial alfalfa seed and other small seeds.
GRASS FAMILY
Gramineae

BARNYARD GRASS
Echinochloa crusgalli (L.) Beauv.

A. Plant
B. Dissected spikelet
C. Spikelets
D. Grain

OTHER COMMON NAMES—
cockspur grass, cocksfoot panicum, panic grass.

DESCRIPTION—A stout summer annual, ½ to over 4 feet high. It reproduces only by seed. It is often spreading and prostrate at the base, rooting at the lower nodes, sometimes forming large clumps.

The hairless leaves are dense, with blades 4 to 20 inches long and ¼ to ¾ inch broad. They may have crosswise purple bands at regular intervals, especially the leaves in the basal rosette. The flowering tops are 3 to 8 or 10 inches long with the erect branches 1 to 2¼ inches long.

The green or purplish flower groups (spikelets) about ½ inch long (excluding the bristle when present) are densely and irregularly crowded on the branches and almost without stalks. They usually are stiff hairy, with some merely sharp pointed at the tip and others ending in a bristle 1½ inches long or less.

The pale yellow, shiny grain is flat on one side and round on the other. A single plant has been estimated to produce as many as 40,000 grains.

DISTRIBUTION — Barnyard grass is a European introduction that has become a most troublesome weed in moist soil in all agricultural areas in the state. It is common in irrigated fields, orchards, pastures, roadside swales, reservoirs, ditches, and streams throughout most of Arizona, 100 to 7,000 feet elevation; flowering July to October.

The name “crabgrass” should not be applied to this grass since that is the accepted for Digitaria sanguinalis.
GRASS FAMILY

Gramineae

WATERGRASS

Echinochloa colonum (L.) Link.

A. Plant
B. Grain-like spikelet

OTHER COMMON NAMES—tigergrass, jungle rice.

DESCRIPTION — A spreading annual, ½ to 2 or 3 feet high, reproducing by seeds. Watergrass closely resembles barnyard grass, the stems spreading and prostrate, often rooting at the base, then ascending. The first growth form frequently is a dense rosette of leaves at the ground level. These and the other leaves often have similar purple bands, but are narrower, ⅛ inch or less broad. Barnyard grass differs principally in the flowers. The flowering part is shorter, mostly 2 to 6 inches long, and the branches of the flowering part are shorter, ⅛ to ⅜ (or to 1) inch long. Also none of the flower groups (spikelets) end in a bristle but are merely sharp pointed. They are crowded on the stem in 2 to 4 more or less regular rows rather than being irregularly arranged.

DISTRIBUTION—Watergrass is found in the same type of places as barnyard grass. It is most annoying in lawns, (where it forms thick basal rosettes), flowerbeds, and gardens. Not so widespread as barnyard grass, it is a most noxious weed in central and southern Arizona's irrigated lands, 150 to 5,500 feet elevation; flowering May to October.

Forms of both watergrass and barnyard grass are grown for their seed in Asia and Africa for human food.
GRASS FAMILY

Gramineae

GREEN BRISTLEGRASS

Setaria viridis (L.) Beauv.

A. Plant with inflorescence
B. Flower & grain of S. viridis
C. Flower & grain of S. lutescens

OTHER COMMON NAMES—green bristlegrass, bottlegrass, pidgeongrass, wild millet.

DESCRIPTION—Weak annuals forming spreading clumps, ½ to 1½ or 3) feet high, reproducing only by seeds. The flattened leaf blades are usually less than 6 inches long, and ½ to ⅜ inch broad. The flowering part is a bristly, cylindrical spike at the end of the stem ¾ to 3 inches long.

The flower groups (spikelets), about ½ to ⅜ inch long, are densely crowded on the spike. At the base of each there arises 1 to 3 (sometimes 4) tawny or purplish bristles, mostly 3 to 4 times longer than the spikelets. The nearly oval grains are about ⅛ inch long, greenish to dark brown and faintly wrinkled, flattened on 1 side and rounded on the other.

DISTRIBUTION—Green bristlegrass, native of Europe, is a common weed in moist soil throughout Arizona and is a nuisance in cultivated fields in the irrigated valleys. It is also found in lawns, ditches, along roadsides, streams and in barren spots in pine forest openings 100 to 8,200 feet elevation; flowering June to November.

Yellow Bristlegrass

Setaria lutescens (Weigel) Hubbard

OTHER COMMON NAMES—pigeongrass, summergrass, yellow bristlegrass, golden foxtail, bristly foxtail, foxtail millet, wild millet, pussgrass.

DESCRIPTION—An annual, closely resembling green bristlegrass. The leaves are longer, 4 to 12 inches long and the flowering spikes may be 4 inches long. It differs principally in that there are at least 5, and usually more (5 to 20), bristles at the base of each flower group. The grains are about ⅛ inch long and thick pointed at the tip.

DISTRIBUTION—Yellow bristlegrass, also introduced from Europe, is found in the same type of places with the same general distribution as green bristlegrass but is infrequent, 100 to 7,500 feet elevation; flowering July to October.
OTHER COMMON NAMES—St. Mary's grass, Aleppograss, maiden cane, Meansgrass, Egyptian millet, false Guineagrass, Cuba-grass, Syriagrass, evergreen millet.

DESCRIPTION—A coarse perennial, 3 to 7 feet high and very leafy, spreading by seed and by an extensive system of underground rootstocks. The bright green leaf blades are up to 2 feet long, and ¼ to ½ inch broad. The many-branched flowering tops are loose, open, and ½ to 2 feet long. The drooping branches come off 2 or 3 at a joint and are naked below.

The flowering groups (spikelets) occur in pairs, but in 3's at the tips of the branches, one is stalked and bears stamens only, while the other is stalkless, thickened, and fertile. The fertile flowering group is about ¼ inch long and has a twisted, once-bent bristle about ½ inch long. The dark reddish brown grains are nearly ¼ inch long without the hull.

DISTRIBUTION—Johnson grass is one of the most abundant and noxious weeds throughout the state, along irrigation ditches, cultivated fields, and moist waste places of any type, 100 to 6,000 feet elevation; flowering April to November. This weed can completely take over agricultural lands unless constant eradication methods are practiced. Its stout underground stems may be 2½ feet deep and the grains may lie dormant for many years making complete eradication almost impossible.

POISONOUS PROPERTIES—Johnsongrass ordinarily is good feed, but sometimes the plant, particularly the leaves contain hydrocyanic (prussic) acid, a cyanide type of poisoning. Any factor which interrupts normal growth may cause the enzyme with the aid of water to change the glucoside into the acid. Rapid growth of new leaves, wilting, due to drought, frost, freezing, cutting, or trampling usually are the most dangerous.
GRASS FAMILY

Gramineae

SIXWEEKS NEEDLE GRAMA
Bouteloua aristidoides (H.B.K.) Griseb.

A. Plant with inflorescences
B. Spikelet
C. Grain

OTHER COMMON NAMES—needle grama.

DESCRIPTION—A low, delicate, short lived, summer annual, reproducing by seeds. The slender stems are 3 to 12 inches (or more) high, from a weak shallow root. The leaves are thin, few, 3 to 6 inches long, and about 1/12 inch broad.

There are 4 to 15 (rarely 20) flower spikes, very narrow below with the base sharp pointed and the top spreading, ⅛ to ⅜ inch long. They are very loosely attached along just 1 side of the stem and drop off easily.

There are 3 short bristles, about 1/5 inch long, from the tip of 1 or more of the flowering bracts in each spike. The narrow, flattened grain is brownish, and about ⅛ inch long.

DISTRIBUTION — Sixweeks needle grama, like sixweeks grama is a native grass which has become weedy. It is found in the same habitat types almost throughout Arizona except in the northeastern part. On denuded areas after the start of the summer rains it sometimes occurs in dense stands, 100 to 5,500 feet elevation, but mostly lower than 5,500 feet; flowering from June to October. This plant and sixweeks grama are alternate hosts for a beet leafhopper.
DESCRIPTION — An annual bunchgrass, branching from the base, from a shallow weak root, reproducing by seeds. The slender stems may be erect or prostrate, sometimes forming mats with the ends ascending, mostly less than 12 inches high but may be much higher. The leaves are scarce, short, ½ to 1½ inches long and narrow, 1/16 inch or less broad.

There are 4 to 7 comblike flower spikes on each stem. These are persistent and do not drop off easily. They are ½ to ¾ inch long with the many (25 to 40) flower groups (spikelets), arising from just 1 side of the spike stem, thus giving the spikes the characteristic comblike appearance. Some of the flowering bracts are tipped by slender bristles, ⅛ to 1/12 inch long.

DISTRIBUTION — Sixweeks grama is a native grass of dry, disturbed, rocky, sandy or caliche soil. It is a common weed throughout the state in waste places, roadsides, city streets, and in all kinds of summer or fall cultivated fields and orchards in the agricultural areas of southern Arizona. It also is abundant on mesas, hillsides, washes, and barren eroded places on overgrazed or deteriorating ranges in the desert, desert grassland or chaparral woodlands, 100 to 6,000 feet elevation but mostly at the lower elevations; flowering principally from July to September or October, but throughout the year in good locations.
**GRASS FAMILY**

**Gramineae**

**MEDITERRANEAN GRASS**

*Schismus barbatus* (L.) Thell.

A. Plant with inflorescences  
B. Spikelet  
C. Grain

**DESCRIPTION** — A low tufted annual, erect, spreading, or often forming large prostrate mats on the ground, reproducing by seeds only. There are many weak stems 2 to 14 inches in length, with very narrow leaf blades, 1/12 inch or less broad and 4 inches or less long.

The flowering part is a small cluster of short purplish branches grouped close together on the upper part of the stem, ½ to 2½ inches long. The flower groups (spikelets), often purple tinged, are ⅛ to ⅜ inch long with 2 long outer bracts (glumes) ⅛ to as long as the rest of the flower group. The shiny translucent grain is oval to egg-shaped and only about 1/25 inch long.

**DISTRIBUTION** — Introduced from the Mediterranean region, this grass has spread rapidly and is now very common in vacant lots, city streets, and roadways, irrigated pastures, and cultivated fields, also on dry slopes, desert mesas, river bottoms or plains, in southern Arizona, 100 to 3,700 feet elevation; flowering January to May. Locally abundant on some southwestern ranges in the state, it assumes some importance as a spring forage plant although it is a relatively recent arrival.

**Arabiangrass**  
*Schismus arabicus* Nees.

This rapidly spreading grass, introduced from Asia or Africa, looks exactly like Mediterranean grass. It differs in that the flowering bracts of the spikelets are more deeply notched at the tip and are long hairy on the back.

The two weeds apparently intergrade freely and cannot always be clearly differentiated. *Arabiangrass*, a more recent introduction than Mediterranean grass, is rapidly appearing throughout its range, and is very common in some localities.
OTHER COMMON NAMES—bottlebrush, squirreltail.

DESCRIPTION — Squirreltail is a tufted perennial, ½ to 1½ feet high, reproducing only by seeds. The leaves are soft hairy to nearly hairless, and 1/12 to 1/5 inch broad. The flowering part is a dense, stiff spike bushy from the many long slender bristles. It is ¾ to 3 (or 4) inches long, and breaks apart easily at each place where the flower groups (spikelets) are attached to the stem.

The flowering bracts of the spikelets all end in long, barb-margined, spreading bristles, ½ to 3½ inches long. Since there are many spikelets and each produces a variable number (about 7 or more) of these long widely spreading bristles, the flower spike is conspicuously bushy at maturity.

DISTRIBUTION—Squirreltail is a native weed. It is a abundant throughout the state and in many types of habitats but nowhere very important. A troublesome weed of roadsides, yards, and waste places, also on barren places of dry hill-sides, rocky slopes, mountain meadows, open forests, to above timber-line, 2,400 to 11,500 feet elevation; flowering March to September. It is fair forage when young but the mature awns work into the flesh and wool of the animals, causing inflammation.
OTHER COMMON NAMES—nutsedge, coco sedge, coco grass.

DESCRIPTION — Closely resembling yellow nutgrass, but the mature stems are usually longer than the basal leaves. The leaves below the flowering heads, 1 to 5 inches long, are about the same length as the flower tops, few are longer. The flower groups (spikelets) are dark brown purple. The runners are fewer, woody and thicker. The nutlets are oblong and covered by persistent reddish scales, whereas they are almost smooth in yellow nutgrass at maturity.

DISTRIBUTION — Purple nutgrass is noxious in the same habitats as yellow nutgrass and particularly is a lawn pest. It is not as well distributed and apparently is confined to the valleys of southern Arizona, 100 to 4,000 feet elevation; flowering July to November. The presence of rootstocks, runners, and nutlets make the nutgrasses very difficult to eradicate.

Yellow Nutgrass
Cyperus esculentus L.

OTHER COMMON NAMES—chufa, ground almond, earth almond, rush nut, northern nutgrass.

DESCRIPTION—A tough, erect perennial, 1 to 3 feet high, reproducing by seeds and by deep rootstocks which form weak, very slender runners above the ground and small tubers or nutlets at the tips of underground stems. The tubers are dark, unevenly globeshaped, % to % inch long and edible, tasting somewhat like almonds. Near the base of the triangular stem a cluster of 3-ranked, grasslike leaves arises which are often longer than the stem, and % to % inch broad.

The umbrellalike flowering tops have a few threadlike stems of different lengths radiating out like spokes from the stem tip. These have numerous, yellowish to golden brown flower groups (spikelets) on the upper part. The flower groups are very narrow, and flattened, 1/16 to 1/12 inch broad and % to 1 (or 1½) inch long. The leaves beneath the flowering tops are 2 to 10 inches or more long and some are much longer than the flower clusters. The brownish 3-angled seed (achene), about 1/16 inch long is narrow and rounded at the top.

DISTRIBUTION — Yellow nutgrass, an Old World introduction, is a noxious weed of wet soil. It is a very bad pest in cultivated fields, (often forming a solid cover over large areas in cotton fields) and pastures, flood plains, dams, ditches, along streams and roadsides throughout the valleys and mountains of Arizona, 100 to 8,200 feet elevation; flowering August to November.
IRIS FAMILY

Iridaceae

IRIS

Iris missouriensis Nutt.

A. Plant in flower
B. Seed pods

OTHER COMMON NAMES—Rocky Mountain Iris, blue flag.

DESCRIPTION — A perennial, 1 to 2½ feet high, reproducing from seeds and from dark reddish, thick, woody rootstocks, mostly horizontal and branching, bearing many stout roots. The long narrow, bluish green leaves in clusters at the base of the flower stems are 2-ranked, flat or folded lengthwise and enfolding one another, ½ to 2 feet long, and ½ to ¾ inch broad.

The flowering stems are 1 to 2½ feet high, usually leafless or with an occasional small leaf, bearing 2 to several flowers, one flower blossoming after another. The large, sweet-smelling flowers are pale blue or violet, about 3 inches in diameter, and 3 to 4 inches long.

The base of the flowers is enclosed by a pair of bracts, leaflike, at first, becoming thin and dryish, 1½ to 3 inches long. The 3 outer parts of the flower curve downward, and are longer than the 3 inner, erect petals. The 3 branches of the style are large, colored similar to the petals and spread outwardly covering the 3 stamens.

The large oblong seed pods, 1 to 1½ inches long, ½ to ¾ inch thick, are 3-celled, with many seeds, usually in 2 rows in each cell. The dark reddish brown seeds are somewhat wedge-shaped with irregular depressions and ridges or D-shaped and plump, ½ to ¾ inch long.

DISTRIBUTION—Iris is a native range weed of wet soil and high elevations. It is common on the high plateaus, and open mountain meadows, near springs, in wet barren flats, or other places more or less denuded of vegetation. It becomes more common on overgrazed, deteriorated ranges. Found in Navajo, Apache, and Coconino counties, and in the mountains of southeastern Arizona, 6,000 to 9,500 feet elevation; flowering May to September.
OTHER COMMON NAMES—Rocky Mountain white oak, shin-nery, shin oak.

DESCRIPTION—One of the two oaks in Arizona which sheds its leaves each fall, Gambel oak is a shrub, (often forming small dense thickets) or a tree, 6½ to sometimes 50 feet high. The bright green alternate leaves are 2 to 6 inches long, deeply lobed, and usually cut more than half way to the midvein.

The pointed, eggshaped acorn is about ½ inch long and matures the first year. The cup is hairless on the inside and covers ¼ to ½ of the acorn.

DISTRIBUTION — Gambel oak is common throughout Arizona except in the extreme western parts. It occurs in open places on mountain slopes, plateaus, and canyons, in yellow pine, pinyon-juniper, and upper chaparral-oak woodland, 5,000 to 8,000 feet elevation. It is a good habitat plant for deer and turkey.

POISONOUS PROPERTIES — Livestock and deer eat the large, abundant leaves whenever available, and the acorns in the fall. It is fairly palatable forage but like all oaks, contains tannins and is one of the principal offenders of oak poisoning, especially among cattle. Poisoning usually occurs in the spring when other forage is lacking. Stock losses result from an almost exclusive oak diet over a considerable period and never occur when even a small amount of supplemental forage is available. In Arizona, Gambel oak poisoning occurs chiefly in the Prescott area.
BUCKWHEAT FAMILY

Polygonaceae

SKELETON WEED

Eriogonum deflexum Torr.

A. Plant with basal rosette
B. Flower
C. Seed

DESCRIPTION — Skeleton weed is a stiff, flat-topped, bushy annual, ½ to 1½ feet high, reproducing only by seed. The stems are greatly branched above and leafless except at the base where a few soft, white hairy, heart-shaped leaves appear, then wither and drop off.

The many small, white or pink flower clusters hang downward, on short stalks about ¼ inch long. The 3-angled dark brown seeds (achene) are ½ inch long or less.

DISTRIBUTION — An abundant, but unimportant weed on dry, disturbed, or rocky soil, on roadsides, vacant lots, city streets, and waste places or eroded areas on desert and desert grassland ranges, 150 to 4,000 feet elevation; flowering March to November.

An extremely drought-resistant plant, flourishing with little or no water. The stems turn a maroon color in the winter and are very conspicuous.
DESCRIPTION—A bright green, erect annual, 8 inches to 3 feet high, reproducing by seeds alone. The wiry, corrugated, principal stems are enlarged at each joint and many branched above, forming the flowering stems. The hairless leaves are alternate, lanceshaped or oblong, ¼ to 2½ inches long and ¼ to ½ inch broad, with thin, dryish, silvery sheaths at the base which encircle the stem. These are very conspicuous, shining and whitish at first, but become shredded and tawny in older parts of the plant.

The small pinkish flowers, on very short stalks, occur in clusters of 2 to 5 along the flowering stems at the top of the plant. The flowering stems compose about half of the mature plant and often are more than a foot long. They are slender and leafless but have small green bracts with white sheaths at the base of each flower cluster.

The pinkish flower parts enclose the fruit until the achene or seed is shed. The shiny 3-angled achene, about 1/16 inch long, is mahogany colored.

DISTRIBUTION — Silversheath knotweed, an introduction from central Asia, is a noxious weed particularly in alfalfa fields, but also in lettuce, cotton and other crop lands in the agricultural valleys of southern Arizona, especially in Maricopa, Pinal and Yuma counties. It is also very common along roadsides and all types of waste places 100 to 3,500 feet elevation; flowering March to November.
OTHER COMMON NAMES—common knotweed, knotweed, doorweed, pinkweed, matgrass, wiregrass, knotgrass, birdgrass, stonegrass, waygrass, goosegrass.

DESCRIPTION—A tough, wiry stemmed, prostrate annual that appears perennial, reproducing only by seeds. The stems branch greatly, spreading out from the root in all directions to form mats ½ to 4 feet in diameter, or the ends may ascend 3 to 9 inches in rich moist soil. They are never erect plants as silversheath knotweed.

The small bluish green leaves are alternate, oblong or lanceshaped, ¼ to 1½ inches long, about ⅛ inch broad, with a very short stalk, encircled by thin papery sheaths. They may be very close together on the stem or widely spaced, but unlike silversheath knotweed, they occur (and approximately all the same size) to the ends of the stems.

The small, white or greenish flower parts are pinkish tinged. They are arranged in small clusters in the leaf axils on the upper part of the plant and not in long leafless branches as in silversheath knotweed. The achene or seed is 3-angled; the surface, except the angles, is dull, very dark mahogany or blackish, and larger, ⅛ to ⅛ inch long.

DISTRIBUTION—Prostrate knotweed, also Eurasian, is very common throughout the state on dry, packed soil of walks, yards, doorways and waste ground where it is a very hardy weed, withstanding trampling and drought. It is also common in more moist soil in lawns, flower beds, cultivated fields, and eroded or overgrazed mountain meadows, 100 to 8,500 feet elevation; flowering March to October.
OTHER COMMON NAMES—field sorrel, horse sorrel, redtop sorrel, cow sorrel, mountain sorrel, sourweed, sourgrass, sourdock, redweed, louseweed.

DESCRIPTION—Sheep sorrel is a tufted perennial with few to many stems, ½ to 2 feet high, reproducing by seed, and by reddish, creeping rootstocks with many slender runners. The stems, also slender and reddish, at the base, are mostly unbranched. Some or all of the leaves are arrowshaped (with a pair of lobes at the base). They are alternate, 1 to 3 inches long (including the stalk), and occur mostly toward the base of the plant, forming a rosette on the ground at first.

The small flowers, of 2 kinds, are formed on many narrow flowering branches at the top of the stems. The male flowers are yellow, the female reddish. They occur on different plants. The shiny, 3-angled seeds (achenes), are mahogany red and 1/16 inch or less long.

DISTRIBUTION — Sheep sorrel grows in moist, disturbed soil, often in barren eroded areas, along roadsides, streams, lakes, and in wet meadows and fields. It frequently forms large, troublesome colonies 10 to 30 feet in diameter to the exclusion of other plants, in oak woodland or mostly yellow pine forests. It is very common in Apache, Navajo, and Coconino counties, but also found in Graham, Gila, Cochise, and Pima counties, 4,500 to 8,700 feet elevation; flowering May to September.

POISONOUS PROPERTIES — Introduced from Eurasia, sheep sorrel contains oxalic acid, giving the plant a sour taste and causing dermatitis in some animals. Horses and sheep in some states have been reported poisoned by eating large quantities of this plant.
OTHER COMMON NAMES — curled dock, yellow dock, sour dock, narrowleaf dock, curleyleaf dock.

DESCRIPTION—Curley dock is a perennial, 1½ to 4 feet high, with a large, deep taproot. It reproduces by seed. The smooth, fleshy stems die back each fall and new ones arise each spring. The bluish green lanceshaped leaves are alternate above, and often a large basal rosette is produced late in the fall. They are 3 to 12 inches or more long (including the stalk) with the edges noticeably wavy and curly.

The small flowers, yellowish green at first but becoming rosy, then reddish brown in fruit are borne in a large, loose, branching flowering cluster, ½ to 2 feet long, at the top of the stems. These aren’t nearly as densely compact as in canaigre.

As in all dock, the 6 flower parts do not look like petals. The 3 inner parts become greatly enlarged, heartshaped, surround the tiny fruit and have the appearance of wings. At maturity these are ¾ to ¾ inch long and usually each has a little wartlike thickening on the back. Each flower produces 1 glossy, triangular seed (achene), about 1/12 inch long.

DISTRIBUTION — Curly or curled dock, also an Eurasian introduction, grows in deep moist to dryish soil. It is very common along roadsides and waste places but is a most noxious weed in permanent pastures, irrigation ditches, and in many cultivated crops. It is found throughout the state from 100 to 8,000 feet elevation; flowering May to October.
BUCKWHEAT FAMILY

Polygonaceae

CANAIGRE

*Rumex hymenosepalus* Torr.

A. Basal portion of plant with tubers
B. Inflorescence
C. Fruit

OTHER COMMON NAME — wild rhubarb.

DESCRIPTION — Coarse perennials with stout fleshy stems, 1 to 3 feet high, reproducing by seed. In canaigre the stems arise from a cluster of 2 to 12 long dahlialike tubers, buried deep in the ground so they are seldom seen. The bright green leaves are hairless and have thin papery sheaths at the base of the stalk, which completely surround the stem (as in all dock species).

The rosette and lower leaves are ½ to 2 feet long, and 2 to 4 inches broad, the edges smooth, not wavy as in curley dock. The crowded flower branches form a very dense, leafless flower cluster, about ½ to 1 foot long, at the top of the stem. These may superficially resemble those of milo maize.

The 6 greenish flower parts are similar to those of curly dock with the 3 inner parts becoming enlarged and enclosing the fruit. These are ½ to ⅓ inch long at maturity, and do not have a wart-like thickening on the back. The seeds (achenes) are very similar to those of curly dock but larger.

DISTRIBUTION — Canaigre is a native plant. Like curly dock it grows in deep moist, often sandy soil along roadsides, fields, streambeds, and stagnant pools throughout most of Arizona, but isn’t nearly as common. It is found at 1,000 to 6,000 feet elevation; flowering very early, in March and April in southern Arizona, and until June northward.

Canaigre contains a high percentage of tannin and the Agricultural Research Service, U. S. D. A. has developed improved varieties that offer promise as a crop. The tannin is excellent in leather making.
GOOSEFOOT FAMILY
Chenopodiaceae

WHEELSCALE SALTBUSH
Atriplex elegans (Moq.) D. Dietr.

A. Plant
B. Fruit
C. Branch of A. fasciculata

OTHER COMMON NAMES — annual saltbush.

DESCRIPTION — A bushy, much branched annual, densely covered by small silverish, mealy scales, and reproducing only by seeds. The erect stems, branching from the base, are 1 to 2 (or 3) feet high and slightly woody at the base. The thin, narrow, alternate leaves, ½ to 1, or 2 inches long, and 1/12 to ¼ inch broad, often have several small teeth along the edge. Frequently the lower leaf surface is silvery and the upper greenish.

The small, inconspicuous flowers are abundant and of 2 kinds, male and female. They occur together in small clusters at the base of the leaves and also form very short spikes at the tip of each stem branch.

The seed is permanently enclosed between 2 wheel-shaped bracts. The grayish bracts are about ½ inch in diameter, with the greenish margin divided into 9 to 20 narrow, distinct teeth. A form (at Tucson) also has a few warty projections on the faces of the bracts.

DISTRIBUTION — Wheelscale saltbush, a native, is abundant in hard-packed, heavy alkaline, dry caliche, or moist fertile soil in cultivated fields, citrus groves, roads, city streets, ditches, and waste places in southern Arizona, 100 to 3,500 feet elevation; flowering May to October but mostly in late summer.

Salton Saltbush
Atriplex fasciculata Wats.

Closely resembles wheelscale saltbush but the stems which are also branched from the base, are prostrate with the tips ascending, rather than erect. This gives the growing plant an entirely different appearance. The leaves are more spatula-shaped, broad and rounded above, narrowed at the base, broader, often ½ inch broad, and with fewer or no teeth along the margins.

The bracts enclosing the seed are also wheelshaped but the greenish margins are not divided into distinct, countable teeth but into minute teeth too short and indistinct to count even with the aid of a lens.

DISTRIBUTION — Salton saltbush grows in the same type of places, has the same distribution and flowering period as wheelscale saltbush but isn't nearly as common.
GOOSEFOOT FAMILY
Chenopodiaceae
WRIGHT SALTBUSH
Atriplex wrightii Wats.

DESCRIPTION — A tall, robust annual, with somewhat woody roots, reproducing only by seeds. The stems are erect sometimes bushy and branched from the base or branching above only, 2 to 4 feet high. The mature leaves, conspicuously silvery beneath (from meal-like particles) and bright green above are broadest above the middle with the tip blunt or somewhat pointed. They are alternate, ¾ to 3 inches long and ¾ to 1 inch broad, the edges smooth, wavy or toothed.

The male flowers are in short dense spikes on conspicuous leafless branches, 2 to 12 inches long, at the top of the stems. Each seed is permanently enclosed between a pair of greenish or yellowish bracts. These bracts are somewhat fan-shaped or broadly triangular, about 1/12 inch broad and with 3 to 7 short irregular teeth across the top. The faces are strongly ribbed, with or without very short knoblike projections.

DISTRIBUTION — This native saltbush is common in alkaline and disturbed soil throughout Arizona, particularly in the southeastern part. It is found in the same type of places as wheelscale saltbush, 100 to 7,000 feet elevations; flowering April to October. It has become a pest in cultivated crops especially cotton, in the Gila and Salt River valleys.

AUSTRALIAN SALTBUSH
Atriplex semibaccata R. Br.
DESCRIPTION — A silvery much branched perennial, reproducing only by seeds. The stems are somewhat woody at the base, reclining or prostrate, and 1 to 3 feet long. The leaves similar to those of Wright saltbush usually have several small teeth along each edge. The bracts enclosing the seed are diamond-shaped, fleshy, reddish at maturity, ½ inch in diameter and have 2 to 5 small teeth near the 2 corners.

DISTRIBUTION — Introduced from Australia, this plant has escaped cultivation and become a common weed in southern Arizona. Valuable (like all saltbushes) as livestock forage and also as a soil binder, it has spread into cultivated fields and become a pest in some areas.
OTHER COMMON NAMES—5-hook bassia.

DESCRIPTION — A tall, stout erect annual, 2 to 5 feet high, reproducing only by seeds. The plant is greatly branched, commonly with one tough principal stem from which many stiff branches arise, often starting near the base. The flat, narrow, pointed leaves are alternate, mostly 3/4 to 1/2 inch long and 1/12 to 3/16 inch broad with smooth edges. Each has a cluster of shorter leaves in its axil or a short spike with many small leaves and flowers, very crowded, and woolly with yellowish hairs. These flower spikes are longer at the tips of the stems, sometimes forming conspicuous branches 2 to 12 inches long at the top. The inconspicuous flowers have no petals.

There is a 5-parted, thin yellowish hairy structure which encloses the seed until it matures. Each of the 5 parts develops a yellowish curved spine, hooked at the tip. The weak spines are 1/16 to 1/12 inch long at maturity, but are obvious in very young flowers. The oval seeds are 1/16 to 1/12 inch long with a dark gray margin.

DISTRIBUTION—Smother weed is a native of Asia. It grows in alkaline wastelands and disturbed soil of roadsides and ditch banks but spreads quickly to adjacent cultivated fields. It was locally abundant in Maricopa and Yuma counties but has spread northward to Mohave, Coconino and Navajo counties, 100 to 5,700 feet elevation; flowering July to October. It is a late summer host of the leafhopper genus Lygus.
OTHER COMMON NAMES—white goosefoot, white pigweed, pitseed goosefoot, fathen, mealweed, frostbite, baconweed, wild spinach, poulette grasse, chou grass.

DESCRIPTION — Lambsquarters is a pale green annual with one main stem, or several, 1 to 4 (or 6) feet high, reproducing by seeds. The plant is more or less white mealy throughout, particularly the flowers and usually the lower sides of the leaves. The variable leaves may be lanceshaped and smooth edged or somewhat egg or wedgeshaped, with a pair of lobes at the base and often with toothed margins. They are alternate, 1 to 5 inches long, and ½ to 2 inches broad.

The small, inconspicuous, greenish flowers are stalkless, arranged in crowded clusters on the short flower clusters at the tips of the stem branches. The black seed is persistently enclosed by the thin membranous fruit wall which gives it a dull appearance. If this membrane is scraped away the seed is shiny and glossy. It is about 1/16 inch in diameter, and diskshaped with a notch on one side.

DISTRIBUTION — Lambsquarters is a nuisance in irrigated lands and cultivated crops. It is also found on river bottoms and eroded areas of overgrazed ranges, brush burns, or logged forest openings, in the desert, desert grassland, pinyon-juniper and yellow pine throughout most of the state, 100 to 9,500 feet elevation; flowering from early summer to fall, May to October. A native from Europe, this weed is good livestock feed.
GOOSEFOOT FAMILY

Chenopodiaceae

NARROWLEAF GOOSEFOOT
Chenopodium pratericola Rydb.

DESCRIPTION—A stout, grayish annual, 1 to 4 feet high, usually branching well above the base, reproducing only by seeds. The lance-shaped or oblong, pointed leaves are short stalked, mostly densely whitish, mealy on the lower surface and greener above, ½ to 1½ or 2 inches long, 1/12 to ¼ inch broad, rarely broader with both large and small leaves occurring together. They may be 1-veined with the edges smooth or 3-veined at the base with 2 indistinct, or short but obvious lobes, 1 on either side toward the base.

The small, stalkless flowers, also densely covered by whitish mealy scales are crowded on short branches in the upper leaf axils and in long, leafless, flowering branches at the top of the plant. The black, shiny, disk-shaped seed, about 1/25 inch in diameter, drops out of the thin, papery covering when mature.

DISTRIBUTION—This native goosefoot grows in moist or dryish, alkaline or disturbed soil. A common weed throughout most of Arizona and especially a pest in cotton and other field crops in the southern part of the state, also found in irrigation ditches, waste places, river flats, and roadsides, 100 to 8,500 feet elevation; flowering May to September.

Slimleaf Goosefoot
Chenopodium leptophyllum Nutt.

DESCRIPTION—An annual, closely resembling narrowleaf goosefoot and always confused with it. Differing in that the leaves are all narrow, always 1-veined, with the margins all smooth, none lobed. The seed is permanently enclosed in the thin colorless covering and thus the surface is dull, not shiny.

DISTRIBUTION—Slimleaf goosefoot is also a native weed, found principally in northern and central Arizona, along roadsides, washes, waste places, and also in barren areas in pinyon-juniper, and yellow pine ranges in Apache, Navajo, Coconino, Yavapai, and Pinal counties, 2,500 to 8,500 feet elevation; flowering August and September.
OTHER COMMON NAMES — swinebane, sowbane.

DESCRIPTION — Coarse, bushy annual with a strong, unpleasant odor, 1 to 3 feet high, reproducing by seeds. The stems are erect or prostrate, then ascending. The bright green, thickish, triangular, eggshaped leaves are alternate, usually pointed at the tip, with 1 to 6 irregular teeth along each margin.

The clusters of flowers, covered by a mealy substance are borne on short branches in the leaf axils and often are more or less hidden by the dense leaves. The tiny, dull black diskshaped seeds, enclosed by the thin membranous fruit wall have a definite rim around the edge, and are about 1/25 inch in diameter.

DISTRIBUTION — Introduced from Europe, nettleleaf goosefoot grows in moist soil. It is an abundant winter, as well as summer weed in southern Arizona and is a great pest in all types of cultivated crops, roadsides, city streets, and waste places in Coconino, Yavapai, Gila, Maricopa, Graham, Pinal, Yuma, Cochise, Pima, and Santa Cruz counties, 100 to 8,000 feet elevation; flowering throughout most of the year.

It serves as a breeding host for the beet leafhopper which causes curley top. Nettleleaf goosefoot is more troublesome in cultivated lands than is lambsquarters.
OTHER COMMON NAME—barilla.

DESCRIPTION—Halogeton is not known to occur in Arizona at this writing, but doubtless it is only a matter of time since it is common along the border both in Nevada and Utah. It is a fleshy annual, 2 inches to 2 feet high, branching from the base and closely resembles young Russian thistle. The mature leaves of halogeton are soft and end in a white hairlike bristle instead of a rigid spine. Also there are tufts of kinky whitish hairs in the leaf axils which are not present in Russian thistle.

The 5 dry, flower parts enlarge and at maturity form showy, yellowish to reddish fanlike wings. They are usually thought of as the fruits but they actually enclose the tiny fruit with its 1 seed. They are about ¼ inch across and may be so abundant in the fall as to hide the stems and leaves. The tiny seed (fruit) like that of Russian thistle shows the coiled embryo.

DISTRIBUTION—Halogeton is a weed of the dry deserts, on barren eroded soil of overgrazed ranges, road shoulders, or any disturbed site; flowering and fruiting July to October with fruits persistent. A native of Russia, it was introduced into the United States in about 1930 and apparently was first identified in Nevada in 1934. It now covers millions of acres in Nevada, Utah, and Idaho, and is found also in Montana, Wyoming, Oregon, and California.

POISONOUS PROPERTIES — Mature halogeton plants contain high concentrations of soluble oxalic acid salts, and are extremely toxic. Sheep are poisoned more often than cattle under usual conditions. A lethal dose for sheep is about ½ pounds of green plant.

Poisoning usually occurs in late fall or early winter, since snow or rain washes out the poison. The poison is not cumulative and a toxic dose must be eaten at one time. The animal becomes dull and cannot move in about 2 to 4 hours after eating a lethal dose, and death may follow within 6 to 10 hours.
OTHER COMMON NAMES—patote, patata, Nuttall monolepis, Papago spinach.

DESCRIPTION—Patota is a low succulent annual with a tap root, and reproduces only by seed. The stems are erect, spreading, or sometimes prostrate on the ground, then ascending, 3 to 15 inches long, usually not more than 8 inches high.

The bright green alternate leaves, ¼ to 2½ inches long, are nearly hairless. They are lance-shaped or have a pair of lobes toward the base.

The inconspicuous, greenish flowers are clustered in the axils of the leaves. The tiny, flat, dark gray seeds (fruit) are circular with a thicker rim, about 1/25 inch in diameter, with the surface minutely pitted.

DISTRIBUTION — Patota grows in moist soil of alkaline depressions, alluvial flood plains, along road-sides and barren areas on mesas, throughout the state in the desert, northern desert, or rarely to yellow pine, 100 to 7,500 (mostly below 3,000) feet elevation. It is prolific in southern Arizona in early spring where it is ephemeral, sometimes covering large areas in almost pure stands. It flowers from January to April, or to May.

Patota is also a common but unimportant weed in cultivated crops where it may flower and fruit from spring until late fall, as in the Yuma and Salt River Valleys. This plant is still used as greens by the Indians, now as in the past.

POISONOUS PROPERTIES — Livestock relish patota and ordinarily it is good feed. It contains large amounts of nitrates, which are not poisonous, but under certain conditions a chemical reaction takes place aided by an enzyme, which quickly changes the nitrates to poisonous nitrites. Poisoning occurs so quickly that there are very few warning symptoms. This is one of the few important poisonous plants in southern Arizona.
GOOSEFOOT FAMILY

Chenopodiaceae

RUSSIAN THISTLE

*Salsola kali* L. var. *tenufolia* Tausch

A. Portion of plant with flowers
B. Seedling
C. Flower & fruit
D. Seed

OTHER COMMON NAMES—tumbleweed, Russian tumbleweed, witchweed, saltwort, common saltwort, prickly saltwort, chardon de Russie, windwitch.

DESCRIPTION—Russian thistle is an intricately branched, bushy, globular annual, \( \frac{1}{2} \) to 4 feet high, the stems ridged and often reddish, reproducing only by seed. At maturity the hard, prickly plant breaks at the ground level, is blown about by the wind and becomes a “tumbleweed”.

The grasslike seedlings and the young plants are fleshy and tender with alternate, narrow pointed leaves, \( \frac{1}{2} \) to 2 inches long. These leaves drop off and the short, stiff mature leaves are awlshaped and end in a spine.

The tiny whitish flowers are clustered at the base of the leaves along the upper branches. There are no petals but the 5 dry, flower parts enlarge, and each develops a large veiny wing. These meet to form a cover over the topshaped, reddish, slightly winged fruit. Each fruit has 1 gray to brownish yellow seed, with the coiled embryo visible.

DISTRIBUTION—Russian thistle is one of the most prolific and most obnoxious weeds throughout the state. Abundant in southern Arizona in irrigated areas, waste grounds, and river bottoms. In northeastern Arizona it is very common on overgrazed ranges and pastures in grasslands, chaparral, pinyon-juniper, and frequently in yellow pine, 150 to 7,000 feet elevation; flowering June to October.

A native of Russia, this plant was brought into the United States in flax seed about 80 years ago and has spread very rapidly. It is a prolific seeder and one plant may produce thousands of seeds. The seeds remain viable for several years and are scattered as the plant rolls along. It is a host plant for the sugarbeet leafhopper, which carries the virus causing curley top in beets. It is also the source of “blight” in other crop plants such as tomatoes, spinach, and beans.
OTHER COMMON NAME — creeping chaff flower.

DESCRIPTION — Creeping chaffweed is a perennial, reproducing by seeds and by thick, deep seated, woody vertical roots. The stems are prostrate or drooping on the ground forming mats \( \frac{1}{2} \) to 2 feet in diameter.

The plant is covered with jointed, distinct hairs, especially at the stem nodes and on the backs of the stiff, papery flower parts. The latter hairs are minutely barbed. The glossy leaves are opposite, \( \frac{3}{4} \) to 1\( \frac{1}{2} \) inches long, appearing hairless but usually with scattered hairs, particularly on the stalks.

The 2 leaves of the same pair are often very unequal in size.

The small whitish flowers are in dense clusters around the stem at the base of the leaves. The rounded seeds are light reddish-brown and shining.

DISTRIBUTION — Creeping chaffweed, a native of tropical America, has become one of the most pernicious pests in southern Arizona lawns in the last few years. It is very aggressive and often covers large areas in bermuda grass lawns, crowding out the bermuda. Found also along road sides, city streets, gardens, and cultivated fields, in Cochise, Pima and Santa Cruz counties, 2,400 to 5,500 feet elevation, flowering June to November.
PIGWEED FAMILY

Amaranthaceae

TUMBLING PIGWEED

Amaranthus albus L.

OTHER COMMON NAMES—white pigweed, tumbleweed, pigweed.

DESCRIPTION—A bushy, much branched annual ½ to 4 feet high, with light green or whitish stems, reproducing by seeds. The bright green, alternate leaves, 1 to 3 inches long, oblong or spatula shaped are often reddish purple beneath, with the veins and margins white edged, the tip sometimes with a short bristle.

The small greenish flowers are in short, narrow clusters in the leaf axils and the 3 awl shaped, spiny bracts below each flower are much longer. The shiny, disk shaped seeds are dark reddish brown or black, about 1/25 inch in diameter, with the surface minutely roughened.

At maturity the large globe shaped plants are stiff, bristly and stickery to the touch. They often are broken off at the ground level and carried about by the wind as a tumbleweed.

DISTRIBUTION—Tumbling pigweed is a common weed throughout Arizona and a pest in cotton, flax and other cultivated fields. It also grows in river bottoms, roadsides, waste places and eroded or rocky slopes on rangelands, 100 to 8,000 feet elevation; flowering May to November. This weed is introduced from tropical America.

Prostrate Pigweed

Amaranthus graecizans L.

OTHER COMMON NAMES—mat amaranth, low amaranth, prostrate amaranth, spreading pigweed.

DESCRIPTION—Prostrate pigweed is very similar to tumbling pigweed but the stems, instead of being erect are prostrate, forming mats on the soil ½ to 2 feet long, and are often pink or purplish rather than pale green. The 3 spiny bracts at the base of each flower are only slightly longer than the flowers. The seeds are all shiny black.

DISTRIBUTION—Prostrate pigweed is a very common and troublesome weed throughout the state in cultivated fields. It is also found along roadsides, river bottoms, mesas, washes, alkaline sinks, railroad tracks, and denuded areas in overgrazed ranges in mesquite, oak, or pine forests, 100 to 8,200 feet elevation; flowering May to November.
PIGWEED FAMILY

Amaranthaceae

FRINGED PIGWEED

Amaranthus fimbriatus (Torr.) Benth.

A. Plant
B. Flower
C. Seed
D. Another plant (showing variation)

DESCRIPTION — An erect annual, sometimes bushy with many branches, 1 to 2 (or 3) feet high. The leaves are alternate, lance shaped or somewhat eggshaped and pointed at the top. They have smooth edges and a short stalk, 1 to 2 inches long.

The small flowers are of two kinds, male and female, with both kinds on the same plant. The male flowers are few and occur together in clusters in the leaf axils, at the stem tips, and at the top of the plant in long nearly leafless spikes.

The many female flowers are very conspicuous and pretty at maturity. The 5 flower parts enlarge and each spreads out above into a thin pinkish white, papery, fanshape structure, the edges of which are slightly fringed. This encloses the little thin-walled fruit whose top falls away as a lid shedding the tiny seed when it is mature. The oval seed is shiny reddish black and only about 1/25 inch in diameter.

DISTRIBUTION — Fringed pigweed is a southwestern native plant, growing in dry sandy or rocky soil of desert washes, mesas, and roadsides from whence it has spread into the cultivated fields particularly in newer agricultural areas, as in Avra and Yuma valleys; common throughout southern Arizona and northward to Mohave and western Coconino counties, 100 to 4000 feet elevation; flowering July to October.
OTHER COMMON NAMES — redroot, quelite, bledo, Palmer amaranth, pigweed.

DESCRIPTION — Careless weed is a tall, stout summer annual 1 to 6 (exceptionally 15) feet high, reproducing by seeds. There is 1 thick principal stem, the lateral branches usually short. It often turns red, particularly in age. The lanceolate or eggshaped, sometimes variegated leaves are alternate, hairless, 2 to 8 inches long (including the long stalks), ½ to 2½ inches broad, with very prominent whitish veins on the lower surface.

The inconspicuous flowers are of 2 kinds, male and female, borne on separate plants, in long, leafless, branching spikes at the top of the plant. The slender central flowering tassel, ½ to 1½ feet long, is much longer than any of the side branches at its base. Both male and female flower parts become stiff and spiny at maturity. The dark reddish brown seed is oval and about 1/16 inch long.

DISTRIBUTION — One of the most common weeds in moist disturbed soils in central and southern Arizona, it also occurs in the northern part of the state. It is a great pest in and around cultivated fields, ditch banks, roadsides, and irrigated pastures. Also abounds in river bottoms, canyon beds, and on overgrazed ranges in the desert and desert grassland, 100 to 5,500 feet elevation; flowering all summer, June to November.

The pollen of careless weed often causes hay fever. The plant is relished by livestock in all stages of growth and is sometimes cut for hay or put into silos. Many stockmen consider it good feed.

POISONOUS PROPERTIES — Careless weed contains nitrate varying from a trace to over 9 percent. As in patota, the nitrate is not poisonous but can be changed quickly into the toxic nitrite by enzymatic action.
PIGWEED FAMILY
Amaranthaceae

SMALL MATWEED
Brayulinea densa (Humb. & Bonpl.) Small

DESCRIPTION—Closely resembling creeping chaffweed but the matted stems are always very close to the ground, the leaves smaller, \( \frac{1}{4} \) to \( \frac{3}{4} \) inch (sometimes \( \frac{3}{4} \) to 1 inch) long. The stems, under leaf surfaces, and flower clusters are white woolly. The long, unjointed, weak hairs are not distinct but soft and entangled.

DISTRIBUTION — Not a city weed like creeping chaffweed, small matweed thrives on dry sandy, hard clay or rocky soil in hot sun or shade on dirt roads, trails, and especially on overgrazed ranges and waste places around ranches, in desert grassland, pinyon-juniper, and oak-pine association, in southeastern Arizona, Greenlee, Graham, Gila, Pima, and Santa Cruz counties, 3,800 to 6,800 feet elevation; flowering June to October. This perennial weed is becoming a serious pest on some ranges in Cochise and Santa Cruz counties.
DESCRIPTION—A brittle stemmed summer annual, reproducing by seeds. The whitish stems often are bright scarlet in the fall. They are erect, prostrate, or drooping on the ground, and many branched. Usually radiating from the root, they are 3 inches to 1 1/2 feet high or long, and may spread to 5 feet in diameter either on the ground or above. The densely hairy leaves are opposite, football or oval shaped, 1/2 to 2 inches long and 1/4 to 1 inch broad. The 2 opposite leaves usually are of different sizes.

The small yellowish flowers about 1/8 inch long, are borne in few flowered clusters in the leaf axils. They have 5 stiff papery flower parts and 5 stamens. The small seeds (fruits) are almost globeshaped.

DISTRIBUTION — Woolly tidestromia grows on rocky or sandy soil. It is widespread in Arizona and is conspicuous after the start of the summer rains, forming whitish mats on mesas, sandy plains, desert slopes, and juniper flats. In southern Arizona this native plant has invaded the newly irrigated lands and has become a pest in cotton fields (as in Avra Valley, Pima County) and in other cultivated crops and irrigation ditches, 100 to 6,000 (mostly lower) feet elevation; flowering July to October. It is also one of the hosts of the beet leafhopper.
DESCRIPTION—A prostrate perennial from a long thick root, reproducing only from seeds. The stems trail on the ground but do not root at the joints. They are $\frac{1}{2}$ to 3 feet long and covered with glandular hairs which collect dirt. The leaves, also glandular hairy are dirty green above, silvery beneath, $\frac{1}{2}$ to 3 inches long, including the stalks. They are oblong or egg-shaped, opposite on the stem and often the pair is of unequal size.

The flowers, in clusters of 3 at the leaf axils, are rose purple and very pretty, $\frac{1}{2}$ to 1 inch in diameter. The narrow brown seed (fruit) is rodshaped, flattened and about $\frac{1}{2}$ inch long.

Down the center of one side there are 2 rows of sticky green glands which are more or less hidden by the 2 overhanging margins. The margins, each with 4 to 6 triangular teeth along its edge may be quite broad and almost meet in the center or they may be very narrow, not covering the glands.

DISTRIBUTION — Trailing 4 o’clock, a native weed, is common throughout most of the state on dry hard soil, along roadsides, sidewalks, paths, and waste places. It is also found on rocky desert mesas and slopes, sandy washes or river bottoms, 100 to 6,000 feet elevation; flowering February to October, but very conspicuous in late summer.
Nyctaginaceae

RED SPIDERLING
*Boerhaavia coccinea* Mill.

OTHER COMMON NAMES — red boerhaavia, common spiderling, common boerhaavia, scarlet spiderling, scarlet boerhaavia.

DESCRIPTION — A stout perennial with tough, prostrate stems radiating outward from a thick woody root and ascending at the ends, 1 to 6 feet long. The stems, often with sticky yellow bands above, are usually noticeable hairy, at least below. Some plants are almost hairless. The leaves are similar to those of Coulter spiderling and are densely hairy to hairless.

In maturity, the flowering part is copiously branched with myriads of tiny threadlike stems, and the flowers occur in umbrellalike clusters of 3 to 25 at the tips of these stems. The flowers are deep reddish purple. The seeds, also 5-ribbed and about ½ inch long, are hairy and covered by glands which contain a very sticky substance.

DISTRIBUTION — This and Coulter spiderling are the most common spiderlings in Arizona, but red spiderling is more troublesome since it is perennial and thus harder to eradicate. Found in the same type of places as Coulter spiderling, this weed grows from Greenlee, Yavapai, and Mohave counties southward, 130 to 7,000 feet elevation; flowering May to November; mostly August to October.
FOUR O'CLOCK FAMILY

Nyctaginaceae

COULTER SPIDERLING
Boerhaavia coulteri (Hook. f.) Wats.

A. Plant
B. Inflorescence
C. Flower
D. Fruit

OTHER COMMON NAMES — Coulter boerhaavia.

DESCRIPTION — An annual, reproducing by seeds. The stems are erect or ascending, 1 to 2½ feet high, or prostrate and radiating outward from the roots and ascending at the ends, 1 to 5 feet long. In rich soil this plant may cover an area of 10 feet. The lower part of the stems may be very hairy, rarely glandular hairy or covered by minute hairs.

Sticky yellow bands on the upper stems are common particularly at maturity, but often none are present. The opposite leaves are unequal in size, eggshaped, usually hairless except along the stalks and sometimes the edges, 1 to 4 inches long.

The flowers are pale pink about 1/12 inch long, in clusters of 1 to 3 and scattered along the upper stem branches for 1 to 2 inches. The wedgeshaped seeds (fruits) are hairless, with 5 broad ridges, and about ½ inch long.

DISTRIBUTION — Found throughout most of the state except in the northeastern part. Especially common and annoying in late summer in southern Arizona in cotton and other cultivated crops, gardens, roadsides, vacant lots, and overgrazed eroded ranges. Growing also in sandy washes, desert plains, and mountain foothills and slopes, 100 to 5,000 feet elevation; flowering June to October.
CARPETWEED FAMILY

Aizoaceae

HORSE PURSLANE

*Trianthema portulacastrum* L.

A. Plant
B. Branch with flowers
C. Flower
D. Fruit
E. Seed

OTHER COMMON NAME—desert purslane.

DESCRIPTION—Horse purslane is a fleshy succulent annual, with a shallow root, reproducing only by seeds. At first the weak, diffusely branched stems are erect but seldom higher than 1 foot (or to 2 or more feet in competition for light, as in a soybean field) before spreading, and finally reclining on the ground, 1 to 5 feet long. The bright green fleshy oval leaves are opposite, the pairs very unequal in size, ½ to 3½ inches long (including the stalks which are widened and 2-toothed at the base), and are ½ to 1¾ inches broad.

The flowers have 6 to 10 stamens, and 5 flower parts about ½ inch long. These are rose purple within and each bears a thickened hornlike tip on the back. The flowers occur singly or a few together in the leaf and branch axils and are open only in the mornings.

The small seed pod is topshaped, with the upper part thickened, 2-crested and falling away as a lid when the 1 to 5 seeds are mature. The thick blackish seeds are squarish or somewhat heartshaped, about 1/12 inch broad and covered by whitish wavy ridges.

This plant is very similar to purslane, *Portulaca oleracea* L.

DISTRIBUTION—Horse purslane is a tropical and subtropical American plant. It is one of the most troublesome annual weeds in the state in all irrigated lands, up to 4,000 feet elevation, particularly in truck crops and gardens in southern Arizona. Also it is common in alkaline flats, roadsides, lawns, and waste places; flowering June to November. This plant is a host of the beet leafhopper.
OTHER COMMON NAMES—pursley, pusley, wild portulaca, duckweed.

DESCRIPTION—A smooth fleshy annual (closely resembling horse purslane Trianthema portulacastrum with which it is often confused), reproducing by seeds. The many branched stems are usually reddish and prostrate, ½ to 2 feet long, often forming mats but the tips are turned upward or sometimes the stems are ascending and nearly erect. The small thick leaves are alternate (not opposite as in horse purslane), either solitary or clustered and spatulashaped with the tips rounded.

The small stalkless flowers, as in horse purslane, occur singly or several together in the leaf and branch axils and stem tips. They also open only in the mornings but are yellow not purplish. There are 7 to 12 (or 20) stamens.

The seed pod is globeshaped, the upper half of which, with the 2-cleft calyx on top, falls away as a lid when the many tiny seeds are mature. The black seeds, broadly eggshaped but flattened are less than 1/25 inch long, with a white spot at the scar.

DISTRIBUTION — Introduced from Europe, purslane is a pest in the same type of places as horse purslane and is abundant in northern as well as southern Arizona. Also common on overgrazed eroded areas, on mountain slopes and meadows, 100 to 8,500 feet elevation; flowering June to October.
CROWFOOT FAMILY
Ranunculaceae

BARESTEM LARKSPUR
Delphinium scaposum Greene

DESCRIPTION—A grayish green perennial reproducing by seeds and from clusters of dark hard woody roots, often forming large or small colonies. The stems are solitary or few, ½ to 2½ feet high. The leaves are divided into narrow segments and mostly clustered at the base.

The flowers are usually an intense royal blue but sometimes lighter blue or nearly lavender. They look exactly like the cultivated larkspurs with the characteristic long spur at the base. The seed pods % to ¾ inch long, split into 3 parts when the many seeds are mature.

DISTRIBUTION — Barestem Larkspur is the most widespread larkspur in Arizona. Found in sandy or gravelly soil on desert mesas and foothills in Apache, Navajo, Coconino, Mohave, Yavapai, Gila, Maricopa, Pinal, Graham, and Pima counties at 2,000 to 5,000 mostly (rarely 8,000) feet elevation; flowering March to April or May and early June in the higher elevations.

Larkspurs are not sufficiently abundant in Arizona to be a serious cause of livestock poisoning except in certain areas. Cattle losses from larkspur poisoning occur very early in the spring and principally in Santa Cruz County, particularly in the Sonotta area; Yavapai County, in the vicinity of Prescott; and Coconino County, near Seligman and between Williams and Flagstaff.

The 9 native Arizona larkspurs may be divided into tall larkspurs (2½ to 6 feet tall, of high moist elevations, flowering in late summer) and low larkspurs (½ to 2 feet tall, of dryer plains and foothills, flowering in the spring). The tall larkspurs may be more poisonous but the low larkspurs are more abundant and probably responsible for the cattle poisoning.

Wooton Plains Larkspur
Delphinium virescens Nutt. subsp. wootoni (Ryd.) Ewan

Very similar to barestem larkspur but the leaves and stems are covered by fine incurved white hairs. Sometimes a few leaves are found just above the basal cluster. The flowers are whitish or pale lavender blue fading buff and the lower petals are white with conspicuous white hairs.

Found in southeastern Arizona on open slopes and plains in Graham, Cochise, Santa Cruz, and Pima counties at 3,800 to 6,000 feet high; flowering April and May. Wooton plains larkspur is probably the cause of larkspur poisoning in Santa Cruz county.
POPPY FAMILY
Papaveraceae

CRESTED PRICKLY POPPY
Argemone platyceras Link & Otto.

A. Branch with flower
B. Flower bud
C. Fruit
D. Seed
E. Flower bud of Argemone intermedia

OTHER COMMON NAMES—chicalote, thistle poppy.
Usually more densely spiny throughout than prickly poppy, with many fine short bristles. The 2 horns on the flower buds are shorter and stouter with several to many short spines in addition to the terminal spine.
Growing in the same situations as prickly poppy in Apache to Mohave County, south to Pima, Santa Cruz, and Cochise counties at 1,500 to 8,000 feet elevation; flowering March to November.

Prickly Poppy
Argemone intermedia Sweet,
OTHER COMMON NAME—white prickly poppy.
DESCRIPTION—Prickly perennials with bitter yellow juice and densely covered throughout with short yellowish spines, reproducing only by seeds. The large white or occasionally pinkish flowers, 2 to 3 inches across are fragrant with 4 to 6 petals and many orange colored stamens. The leaves are alternate, bluish green, deeply lobed, clasp the stem at the base and are 2 to 3 inches long.
There are 2 green sepals covering the flower bud. Each bears a long slender horn which ends in 1 stiff spine, and usually with no additional spines but sometimes 1 to 3 very slender ones near the base. The prickly oblong seed pods are 1 to 1½ inches long and produce many dark brown or blackish seeds. The rounded seeds are about 1/16 to 1/12 inch in diameter, the surface finely honeycombed and with a raised scar down one side.
DISTRIBUTION—A native plant growing in dry disturbed soil of roadsides, old fields, waste places, washes, mesas, and uncultivated areas. These are very drought resistant plants. They come in abundance on overgrazed ranges and are an indication of severe deterioration. Found in Yavapai, Maricopa, Pinal, Cochise, Santa Cruz, and Pima counties at 1,500 to 5,400 feet elevation; flowering March to November.
Prickly poppy may cause livestock poisoning but is rarely eaten

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POPPY FAMILY
Papaveraceae

GOLDEN CORYDALIS
Corydalis aurea Willd.

A. Plant
B. Flower
C. Seed

DESCRIPTION—Low bluish green, fleshy biennials or short lived perennials, reproducing by seeds. The weak hairless stems, diffusely branched and spreading from the base, are often prostrate with the tips turning upward. The leaves are dissected into many small segments.

The narrow bright yellow flowers, % to ¾ inch long have a short conspicuous spur at the base and 2 sepals. They occur in short spike-like flower branches at the end of the stems. The bluish green seed pods are usually curved and often hang downward. They are cylindrical, ½ to 1 inch long and produce many very black and shining seeds.

The smooth seeds have rounded margins and are about 1/12 inch in diameter.

DISTRIBUTION — Golden corydalis is widespread throughout the state except in the extreme southwestern part. Common in moist disturbed soil of roadsides, open flats, river bottoms, stream banks, rocky slopes, in creosote-mesquite desert, sagebrush, grassland, oak woodland, pine forests, and spruce-fir associations at 1,500 to 9,500 feet elevations; flowering March to August.

POISONOUS PROPERTIES — Golden corydalis contains 10 alkaloids some of which are known to be poisonous.
MUSTARD FAMILY

Cruciferae

BLACK MUSTARD
Brassica nigra (L.) Koch.

A. Plant
B. Fruit
C. Seed

OTHER COMMON NAMES—cadlock, warlock, scurvy, senvil, "Trieste" mustard, brown mustard.

DESCRIPTION — A stout erect annual, 2 to 6 feet high with a large taproot, reproducing only by seeds. The dark green alternate leaves all have stalks and are hairless or with a few scattered stiff hairs. The lower leaves are large, 4 to 16 inches long with one large terminal lobe and one or more pairs of small lobes below, the edges all with small teeth. The uppermost leaves are reduced, narrow and not divided, commonly drooping.

The flowering part at the top of the plant is 1 to 2 or more feet long with the branches spreading almost at right angles. The bright yellow flowers have 4 petals with yellow veins.

The narrow erect seed pods ¾ to ¾ inch long at maturity and about 1/12 inch broad, are on short stalks. They are tipped by a slender beak ¼ inch long or less. The pods stand close to the stem and often overlap one another. The seeds, in 1 row in each half of the pod, are almost oval, dark reddish brown or nearly black, about 1/16 inch long with the surface minutely pitted.

DISTRIBUTION—Black mustard was introduced from Eurasia. It is common in spring grain fields and other early crops, pastures, gardens, roadsides, and river bottoms throughout most of Arizona, 100 to 8,300 feet elevation; flowering March to October. This plant is the principal source of table mustard.
MUSTARD FAMILY

Cruciferae

SHEPHERDS PURSE
Capsella bursa-pastoris (L.) Medic.

A. Plant with various leaves
B. Flower
C. Fruit and seed

OTHER COMMON NAMES—caseweed, St. James weed, mothers heart, ladys purse, pepperplant, pickpurse, shepherds bag, shovel weed, shepherds pouch, pickpocket.

DESCRIPTION—An erect annual or winter annual, with a thin tap root, \( \frac{1}{4} \) to \( 1\frac{1}{2} \) feet high, reproducing only by seeds. The slender stems, usually branching are sparingly covered by long gray hairs. A spreading rosette of leaves is formed first on the ground. These leaves are variously toothed, cut or deeply lobed, often with a larger lobe at the tip, and \( 1\frac{1}{2} \) to 5 inches long (including the stalk).

The stem leaves are alternate, often arrowshaped, the edges smooth or toothed. These are without stalks and clasp the stem with an earlike lobe on either side.

The small white flowers with the petals only \( 1/12 \) to \( 3/8 \) inch long are on slender stalks which elongate as the pods mature. They occur along the upper leafless part of the stems but the pods often are found almost throughout the length of the stem.

The flat seed pods are inverted heartshape or triangular with the broad notched end on top and narrowed to a point at the base, about \( 1/4 \) inch broad. The tiny reddish or orange brown seeds are oblong, shiny, about \( 1/25 \) inch long with a groove down each face.

DISTRIBUTION — A European introduction, shepherds purse is common throughout the state. It is primarily a lawn pest but also is very common in cultivated crops, orchards, pastures, and roadsides or waste places near them, 100 to 8,000 feet elevation; flowering practically the year around in moist cultivated fields in the low valleys or at the higher elevations, but usually disappearing in May in dry low elevation areas.
OTHER COMMON NAMES—cress, green tansy mustard.

DESCRIPTION—An erect annual or winter annual, ½ to 3 feet high, reproducing only by seeds. The plants are usually ash colored from the many short soft, forked or star-like hairs, or they may be only moderately hairy and green. The stems are often purplish. The alternate leaves are once or twice divided into fine segments, 1 to 4 inches long.

The tiny flowers about 1/12 inch long are yellow or whitish, and on short slender spreading stalks which elongate as the pods mature. They occur along the upper part of the stems. The short narrow seed pods are somewhat stubby, ¼ to ½ inch long, and have 2 rows of seeds in each half. The tiny oblong seeds are dull red about 1/25 inch long and have a groove on 1 side.

DISTRIBUTION — Tansy mustard is a native weed which is abundant in moist spots throughout the state on sandy, rocky or disturbed soil of riverbeds, washes, mesas, canyons, slopes, and swales in creosote, desert, grassland, sagebrush oak and pinyon juniper associations. It is also a troublesome weed in cultivated lands, grain fields, city streets, and waste places, 100 to 7,000 feet elevation; flowering December to August, mostly March and April at the lower elevations.

POISONOUS PROPERTIES — Tansy mustard contains no poisonous principle but may cause trouble under certain conditions. These plants appear on the ranges in abundance in early spring and livestock may eat them almost exclusively. This sudden change in diet often results in diarrhea and other dietary disorders.

The pods also are relished by livestock. The mature seeds are rich in oil of mustard. If eaten in large amounts over a period of several days and without sufficient other feed, severe kidney irritation may result.

Flixweed

Descurainia sophia (L.) Wats.

Similar to tansy mustard, but the leaves are much more finely divided, brighter green and less hairy. The pods are much longer, ¼ to ½ inch long, very narrow and the seeds are in 1 row in each half.

Introduced from Eurasia, flixweed is found in the same type of places with the same general distribution as tansy mustard but is not as abundant except in some local areas; flowering mostly March to May.

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DESCRIPTION — A low bushy erect spreading or prostrate annual or winter annual, ¾ to 2 feet high reproducing only by seeds. The narrow lanceshaped or spatulashaped leaves are 1/12 to ⅛ inch broad, mostly smooth edged, sometimes toothed, or the basal leaves may be lobed. The grayish starlike hairs are often so dense as to give the plant a silvery appearance.

The bright yellow flowers are ¼ to ½ inch long often fading reddish. The inflated ballshaped pods, ⅛ to 1/5 inch in diameter are tipped by a slender point (the persistent style) 1/12 to ¼ inch long and are hairy or hairless. The stalks of the mature pods are spreading often curved twice in opposite directions like the letter “S”.

The reddish brown, flattened, fanshaped seeds are about 1/12 inch broad and about 1/16 inch long, the edges crinkled. There are several seeds in each half of the pod.

DISTRIBUTION — An abundant native plant, Gordon bladder pod is a weed in irrigated fields, roadsides, yards, disturbed soil and overgrazed desert ranges, also grows in river bottoms, mesas, plains, slopes and canyons throughout southern Arizona from Greenlee to Mohave counties and southward, 110 to 5,000 feet elevation; flowering February to May.
OTHER COMMON NAMES—sand peppercress, hairy pod peppergrass, sand pepperweed.

DESCRIPTION — Bushy annual, 1 inch to 1 1/4 feet high, reproducing only by seeds. The stems are erect or prostrate, usually profusely branched from the base, with short stiff straight hairs lying flat on the surface or with rather long stiff bristly spreading hairs. The leaves, 1 to 6 inches long, (including the stalks), are alternate, broader toward the tip and may be merely toothed, deeply lobed or cut into very fine segments. They often drop off as the plant matures.

The petals are tiny and white less than 1/12 inch long, but often are lacking completely. The rounded seed pods, notched at the tip, are covered with short bristly hairs or sometimes are hairy only along the edges, 1/8 to 1/6 inch long and about 1/6 inch broad. Their stalks are not rounded but noticeably flattened, hairy on both sides or hairless on the lower surface. They contain only 2 seeds, 1 in each half of the pod.

The reddish oval seeds have a narrow membranous margin all around the edge but wider at the top.

DISTRIBUTION — Sand peppergrass, a native plant, is abundant throughout the state in the northern as well as the southern part, in sandy or rocky disturbed soil along roadsides, in fields, pastures, waste places, eroded hillsides on overgrazed ranges, mesas, washes, and river bottoms, 100 to 6,500 feet elevation; flowering January to June, but mostly March and April.
MUSTARD FAMILY
Cruciferae

LONDON ROCKET
Sisymbrium irio L.

A. Plant
B. Fruiting branch
C. Flower
D. Fruit
E. Seed

DESCRIPTION—A bright green fleshy annual or winter annual, hairless or with a few hairs near the base. The stems are usually much branched from the base 1 to 3 feet high, from a coarse tap root, and reproducing by seeds only. The dark green divided leaves are 1 to 8 inches long (including the stalk), with a large, pointed terminal lobe and 1 to 4 pairs of smaller lobes below. The divisions of the upper leaves are almost as large as those on the lower.

The small yellow flowers, 1/12 to 3/8 inch long are borne on slender stalks in small clusters at the stem tips. The flower stems elongate as the seed pods mature so there are many, spreading very narrow pods below the flower clusters. The mature seed pods are 1 1/2 to 2 inches long. The tiny reddish brown oblong seeds are 1/16 inch long with a ridge and two depressions on each face.

DISTRIBUTION — London rocket is a native European weed which is very troublesome and abundant throughout the irrigated lands of Arizona, in all commercial crops, gardens, citrus orchards, pastures, roadsides, canyon bottoms and waste places, 100 to 4,500 feet elevations; flowering December to May, or all summer and fall in moist soil of cultivated fields.

One of the first green weeds to appear in the winter in southern Arizona, London rocket usually disappears (except in moist shaded places) when the weather becomes hot. It is a prolific seeder.
OTHER COMMON NAME—western clammy weed.

DESCRIPTION — An erect branching glandular hairy annual, very sticky and clammy to the touch with an unpleasant odor, ½ to 3 feet high, reproducing by seeds. The leaves are divided into 3 lance-shaped leaflets; the upper and those of the flowering stems are not divided.

The 4 petals are whitish or yellowish but the numerous (12-32) stamens with their long purple stalks give the flowers a purplish appearance. The flowers are densely crowded along the upper part of the stems. The sticky seed pods resemble mustard pods. They are long and slender and at maturity are 1½ to 2½ inches long, on jointed or unjointed stalks ½ to 1 inch long.

The reddish brown seeds are rounded about 1/12 inch in diameter, grooved through the center and the surface minutely pitted in circular lines.

DISTRIBUTION—Clammy weed is a native plant growing in disturbed soil along roadsides, waste places, denuded areas, and in sandy canyon washes or stream beds, from Navajo and Coconino counties southward, 1,000 to 6,500 feet elevation; flowering May to October.
OTHER COMMON NAMES—silverweed, richette, Argentine.

DESCRIPTION—A low silvery, tufted perennial, ¼ to 1 foot high, reproducing by seeds and by wiry jointed runners. The leaves 2 to 10 inches long are divided into 5 to 11 pairs of large leaflets with smaller ones in between, the edges all coarsely toothed. These may be densely silky hairy on both surfaces or often green and nearly hairless above.

There are 5 conspicuous bright yellow petals which fall off quickly, and many stamens. The thick reddish, egg-shaped seeds (achenes) are somewhat grooved, about 1/12 inch long and borne in the outer green cuplike flower parts.

DISTRIBUTION—Silver cinquefoil, an Eurasian introduction, is primarily a range weed on denuded or thinly vegetated moist, cool ground. It replaces the grasses on overgrazed wet mountain meadows and often is abundant in certain areas. Found in yellow pine, spruce fir and sometimes pinyon juniper ranges, in Apache, Greenlee, Navajo, and Coconino counties, 5,600 to 9,500 feet elevation; flowering May to August. The roots are sweetish and edible either raw or cooked.

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Rough Cinquefoil
Potentilla norvegica L. (P. monspeliensis L.)

OTHER COMMON NAMES—barren strawberry, tall five finger, strawberry weed.

DESCRIPTION—An annual or biennial ½ to 3 feet high reproducing by seeds only. Although closely related to silver cinquefoil, it is quite different in appearance since it is a nearly erect green plant. The stems are weak and spreading at the top but not falling to the ground.

The leaves are rough hairy and green on both surfaces never silky. Also the leaves are divided into just 3 (or 5) leaflets, not in pairs but arising from a common point as in strawberry leaves. The petals are much smaller and the light brown achenes with curved branched ridges on the surface are only 1/25 inch long.

DISTRIBUTION—Introduced from Europe, rough cinquefoil has the same general distribution, habitat, and flowering period as silver cinquefoil. It is much more common and aggressive, however, competing favorably with other weeds in the densely weedy patches of mountain meadows, pastures, fields, and road-sides.
OTHER COMMON N A M E S — mescat acacia, fragrant acacia.

DESCRIPTION — Whitethorn is a tall shrub up to 10 feet high mostly armed with slender straight, white spines in pairs, ¼ to 1½ inches long. Some limbs are spineless or often entire plants may be spineless. The leaves are twice divided, first into 3 to 7 (or sometimes only 1 or 2) pairs of main divisions and are further divided into 5 to 16 pairs of tiny secondary leaflets.

The small fragrant golden yellow flowers are clustered into many flowered conspicuous balls on long stalks, these arising from the leaf axils. They derive their color principally from the many (30 to 40 to each flower) stamens which are much longer than the 5 tiny yellow petals. The reddish brown curved pods, 2½ to 5 inches long are about ½ inch broad and indented or constricted between each seed.

In southeastern Arizona the twigs, leaves, and pods of many plants are very glandular and sticky. The boat shaped smooth seeds, about ¼ inch long and 1/12 inch broad, are mottled dark brown, gray and black.

DISTRIBUTION — Abundant in rocky caliche or limestone soil along washes, slopes and mesas throughout the deserts and desert grasslands of southern Arizona. Also occurs in central Arizona in the lower chaparral, desert grassland, and desert shrub associations, 2,000 to 5,000 (rarely 6,250) feet elevation; flowering May to November, mostly May to July.

Although browsed to some extent, whitethorn has little forage value and has become a range pest in some areas because of its encroachment on grasslands, as in Cochise county.

POISONOUS PROPERTIES — Whitethorn, like Johnsongrass, produces hydrocyanic acid under certain conditions.
DESCRIPTION—A spiny intricately branched, completely hairless shrub 1½ to 4 feet high, reproducing by seeds but principally from deep and extensive rootstocks. The greenish stems bear slender vicious spines, green with yellow tips, ¾ to 1⅛ inches long. The alternate wedgeshaped leaves, yellowish green above, bluish green beneath, are ¼ to 1⅛ inches long, ½ to ⅛ inch broad and have very short stalks.

The small sweetpea-like flowers about ⅛ inch long are pinkish purple or maroon. These occur on short slender, spinetipped branches which arise uniformly and in large numbers along the upper part of the stems. When the seedpods mature and fall off, these branches become persistent spines.

The reddish brown jointed seed pods are curved upward and commonly have 1 to 4 seeds or up to 9. The pod is deeply indented and each seed is clearly outlined like a bead on a string. The kidneyshaped seed is grayish brown, about ¼ inch long and 1/12 inch broad.

DISTRIBUTION — Camel thorn, introduced from Asia, grows principally in deep moist soil but also in dry rocky soil. Abundant in colonies along the banks, bottomlands and drainage of the Little Colorado and Salt rivers, along canals, irrigation ditches, and sometimes spreading to adjacent cotton and other cultivated fields, in Navajo, Coconino, Gila, Maricopa, and Yuma counties, 100 to 5,000 feet elevation; flowering May to July, the seed pods persisting until October or November.

The underground rootstocks branch greatly but usually after they are 2 to 4 feet deep. Once established, a colony increases in size each year. In less than 20 years the infestation along the canals near Gillespie dam (Maricopa county) has become almost continuous for more than 15 miles.
OTHER COMMON NAMES—Nuttall loco, Emory loco, red-stemmed peavine.

DESCRIPTION—A grayish slender annual, thinly covered with straight grayish hairs lying flat on the surface, reproducing only from seeds. The few weak stems are almost erect and usually less than a foot high when growing with other plants. On barren soil they are prostrate, branch profusely and radiate from a somewhat woody taproot, \( \frac{1}{2} \) to \( \frac{3}{2} \) feet in diameter and often appear perennial. The leaves are divided into 3 to 6 (or 8) pairs of small narrow leaflets, the tips rounded, pointed or with a slight notch.

The small sweetpea-like flowers are light purple fading to nearly white, then drying blue. Two to 6 flowers (and later the seed pods) are clustered near the end of stiff threadlike stalks, 1 to 3 inches long. The stalks are solitary at the end of the stems and in the leaf axils.

The narrow flat pods \( \frac{1}{2} \) to \( \frac{3}{4} \) inch long and 1/12 to \( \frac{1}{2} \) inch long curve upward, are thinly hairy, or may be hairless, and slender pointed at the top. The tan colored flattened seeds are narrowly squarish with a deep notch in one edge, and about 1/12 inch long.

DISTRIBUTION—Peavine is a native plant and a common lawn pest particularly in new lawns, yards, ditches and fields. It is abundant throughout the state on barren dry or disturbed soil along roadsides, waste places, river bottoms, mesas, slopes and canyons, in southern and northern desert, desert grassland, chaparral and oak woodland ranges, from 100 to 4,000 feet and infrequent to 7,000 feet elevation; flowering February to May and sometimes again after the summer rains.

POISONOUS PROPERTIES—Peavine, growing on limestone or red sandy soil, has definitely been found to be poisonous to sheep, cattle and goats but not harmful when growing on other soil types. It is not classed as a seleniferous plant.
OTHER COMMON NAME—bladderpod loco.

DESCRIPTION—A rank spreading annual, biennial, or short-lived perennial from a thick taproot, reproducing by seeds. The weak stems are greatly branched from the base, erect and bushy at first but sprawling on the ground in age, usually not over 1 foot long and mostly less. The leaves are divided into 4 to 11 pairs of small narrow grayish leaflets, 1/12 to 1/6 inch broad with inconspicuous straight hairs lying on the surface.

The sweetpea-like flowers are reddish purple fading paler and only 1/8 to 1/6 inch long. The flower stalks 1 to 2 1/2 inches long arise in the leaf axils, bear about 5 to 10 flowers and usually do not extend beyond the leaves. The yellowish thin walled pods are papery and greatly inflated when mature. They are nearly straight along 1 edge, strongly curved on the other, 1/8 to 1 1/2 inches long.

The reddish brown flattened seeds are broadly kidney-shaped about 1/6 inch long and have a notch on 1 edge.

DISTRIBUTION—Wooton loco is a very common native plant growing mostly on dry sandy soil along roadsides, mesas, plains, slopes and washes throughout the state. In wet springs it often covers large areas (i.e., between Window Rock and Holbrook), in both northern and southern desert, desert grassland and sometimes oak woodland ranges, from 1,300 to 7,000 feet elevation; flowering March to May or June and sometimes again in August.

POISONOUS PROPERTIES—Wooton loco is definitely known to cause loco poisoning in livestock. However, it is not a serious problem in Arizona because animals do not like it and usually will not eat it.

Halfmoon Loco

Astragalus allochrous Gray

Halfmoon loco must be mentioned because it is always confused with Wooton loco and has the same geographical and habitat distribution. It is larger. The stems are 1 to 2 feet long, the leaves have 11 to 19 pairs of leaflets 1/12 to 1/4 inch broad, and the pods are larger and more conspicuous 1 1/2 to 1 3/4 inches long.
OTHER COMMON NAMES—Cove cassia, hairy senna.

DESCRIPTION—A bushy perennial covered with fine white hairs reproducing by seeds only. The stems are 1 to 2 feet high branching from a woody base. The grayish green leaves are 1 to 2 inches long including the stalks. They are divided into 2 to 4 pairs of large oblong, point tipped leaflets, ½ to 1¼ inches long.

The flowers are in several to many stalked clusters at the top of the stems and in the leaf axils. They have 5 large yellow petals about ½ inch long, with reddish veins, and 10 stamens with large orange anthers. The slightly curved pods, ¾ to 1¾ inches long are tipped by a stiff point about ⅛ inch long. They pop open with force when mature throwing the seeds some distance from the plant.

The pinkish brown seeds are pearshaped deeply wrinkled and flattened, about ⅛ inch long.

DISTRIBUTION Desert senna is a very common native weed of dry disturbed soil throughout the state, along roadsides and waste places, also common on rocky slopes, mesas, sandy river bottoms and washes in desert, northern desert, and desert grassland ranges, mostly from 1,000 to 3,500 feet elevation; flowering from spring until fall, March to October.

Twoleaf Desert Senna
Cassia bauhiniodes Gray

Looks almost exactly like desert senna except the leaves are divided into just 2 leaflets (1 pair) and there are only 2 flowers in each stalked axillary cluster with no flowers borne at the tip of the stems.

It has the same distribution and habitat as desert senna but at slightly higher altitudes, and is more common on northern Arizona desert rangelands, 2,000 to 5,500 feet elevation; flowering from April to September.
PEA FAMILY

Leguminosae

SLIMPOD SENNA

*Cassia leptocarpa* Benth. var. *glaberrima* Jones.

A. Flowering branch
B. Leaf
C. Pods
D. Seeds

OTHER COMMON NAME — longpod senna.

DESCRIPTION — A rank smelling, bushy very leafy perennial, 2 to 3 feet high, reproducing by seeds. The stems are greatly branched above often spreading 2 to 4 feet in diameter. The alternate leaves are a deep bright green 3 to 7 inches long, and divided into 4 to 8 pairs of sharp pointed lanceshaped leaflets. These are 1 to 2¼ inches long and nearly hairless except for the short eyelashlike hairs around the edges. Near the base of the leaf stalk there is a large gland.

The showy orange yellow flowers are on long flowering branches at the top of the stems. There are 5 petals, ½ to ¾ inch long and 10 stamens with large orange anthers. The long slender pods are several in a drooping cluster. They are dull brown 5 to 10 inches long when mature and have 1 row of seeds. These are grayish brown, broadly cubical in shape and about ¼ inch in diameter.

DISTRIBUTION—Slimpod senna is a native range weed found in very much the same type of places as the other sennas. It is common along roadsides, streams, washes, canyons and eroded areas in southeastern Arizona desert, desert grassland, and desert shrub ranges, largely in Graham, Pinal, Cochise, Santa Cruz, and Pima counties, 2,500 to 5,500 feet elevation; flowering June to September.
OTHER COMMON NAMES—pignut, camote de raton, Indian rushpea.

DESCRIPTION — A low weak, slender stemmed perennial ½ to 1 foot high, reproducing from seeds, from creeping underground rootstocks, and from deep seated nut-like tuberous enlargements of the roots. The twice divided leaves are alternate, 2 to 5 inches long including the stalks and are covered with glandular dots and fine incurved hairs. They are divided into 3 to 5 pairs of primary leaflets (or divisions) each of which is further divided into 5 to 10 pairs of oblong secondary leaflets only ½ to ¾ inch long.

The flowers have 5 yellow or orange red petals about ½ inch long, each narrowed into a stalk covered with small glands. The flowers occur along the upper part of the stems, the flowering part only about 2 to 6 inches long and covered with small sticky tack-shaped reddish glands. The flattened slightly curved pods ½ to 1¾ inches long are dark reddish brown and have few to several seeds. The grayish seeds are smooth, flattened eggshaped and slightly more than ½ inch long.

DISTRIBUTION—Hog potato is a very common native weed often forming large colonies in heavy alkaline soil along roadsides, ditch banks, and waste places, becoming a troublesome pest when it spreads to adjacent cultivated lands and pastures. It is common throughout most of the state especially in irrigated areas at the lower elevations, 100 to 5,000 feet elevation; flowering April to October.

The tubers are 1½ feet deep or more and relished by hogs. The Indians considered them quite a delicacy after they were roasted. However, they and the rootstocks together enable this plant to become quickly established and it should be eradicated from cultivated fields and gardens when it first appears.
PEA FAMILY

Leguminosae

KING LUPINE

*Lupinus kingii* Wats.

**DESCRIPTION** — A low bushy hairy annual 3 to 8 inches high the dense hairs long and fine. The leaves are alternate and divided into 5 (sometimes 6 to 9) leaflets which arise from a common point at the end of the short (1/4 to 1 1/2 inches long) hairy leaf stalks.

The small sweatpea-like flowers about 1/4 to 1 1/2 inch long are blue or violet with whitish centers. They are crowded very close together on short flower branches only 1/2 to 3/4 or 1 inch long, which rarely extend beyond the leaves. The mature seed pods are eggshaped 1/8 to scarcely 1/2 inch long and contain just 2 seeds. The grayish tan seeds are rounded, plumpish scarcely 1/8 inch in diameter with the surfaces smooth.

**DISTRIBUTION** — A very common native weed in rocky clay or disturbed soil along highways, old fields, vacant lots, and waste places. Also locally abundant on eroded or overgrazed meadows and openings in yellow pine and sometimes in pinyon juniper ranges, mostly in northern Arizona from Apache to Coconino and Yavapai counties, rare southward in Graham, Cochise, and Pima counties, 5,500 to 8,000 feet elevation; flowering May to September, mostly June to August.

King lupine contains poisonous alkaloids but is not known to be the cause of livestock poisoning.

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**Low Lupine**

*Lupinus pusillus* Pursh

**OTHER COMMON NAMES** — rusty lupine, intermountain low lupine.

A low annual with the appearance of King lupine. Differing in that the flower branches are 1 to 2 1/2 inches long with the flowers not as crowded; also the pods are oblong, 1/2 to 3/4 inch long and are indented or constricted between the 2 seeds. Low lupine occurs in dry sandy soil of mesas, canyons, and wastelands in northern Arizona, mostly on pinyon juniper ranges, from Apache to Mohave counties, 4,500 to 8,000 feet elevation; flowering May and June.

**POISONOUS PROPERTIES OF NATIVE LUPINES** — Among the 22 kinds of native lupines in Arizona, 2 are important elsewhere as the serious cause of livestock poisoning, chiefly to sheep. Silvery lupine (*L. argenteus* Pursh), the most common perennial lupine in the forests of northern Arizona at 7,000 to 10,000 feet elevation, is very important in most western states, and low lupine is very serious in Kansas. Lupines are not known to be the cause of livestock fatalities in Arizona.
PEA FAMILY

Leguminosae

BUR CLOVER
Medicago hispida Gaertn.

A. Plant
B. Flower
C. Fruit
D. Seed

DESCRIPTION—A bright green nearly hairless annual or sometimes winter annual reproducing only by seeds. The weak stems branch from the base and are spreading or lie on the ground and often the tips ascending, ¼ to 2 feet long. The leaves are alternate and divided into 3 leaflets which arise from a common point at the end of the leaf stalk. The leaflets are somewhat wedgeshaped, the edges toothed and the tip indented. Where the leaf stalk joins the stem there is a pair of small leaflike structures with long irregular teeth.

The small yellow sweetpea-like flowers are borne 3 to 5 in a cluster near the end of short stalks. The peculiar seed pods are netted, veined and spirally coiled about ¼ to ½ inch in diameter. The spiral consists of 2 or 3 turns with a double row of curved prickles along its sharp edge.

The pods are straw colored or brown when mature and contain several kidneyshaped seeds. The seeds are yellowish or tan colored about ½ inch long and slightly sticky.

DISTRIBUTION—Bur clover is an Old World introduction. Although it is high in forage value it is a very troublesome weed in bermuda lawns and to some extent in alfalfa seed crops in southern and central Arizona, 100 to 5,500 feet elevation; flowering mostly March to May but in moist situations it may flower at almost all seasons.

Alfalfa
Medicago sativa L.

One of the most important of all cultivated forage plants, alfalfa also an Old World introduction, is very closely related to bur clover and black medic. It is entirely different in appearance, since it is an erect perennial with blue or violet flowers, but its seeds are very similar.
PEA FAMILY

Leguminosae

BLACK MEDIC
Medicago lupulina L.

A. Plant
B. Flower
C. Seed

OTHER COMMON NAMES—yellow trefoil, nonesuch, black clover, hop medic, hop clover.

DESCRIPTION—A low trailing annual, biennial or perennial reproducing by seeds only. The slender hairy, 4 angled stems are prostrate or partly so, branching from the base and radiating out from the taproot, ½ to 2 feet long. The leaves are divided into 3 leaflets very similar to those of bur clover with the tips rounded and finely toothed and the veins prominent. However, the central leaflet is on a short stalk.

The flowers are also sweetpea-like, small and bright yellow about ½ inch long but many are clustered together. They are crowded into short dense spikes, which are on stalks 1 to 3 inches long. The small seed pods are somewhat kidney-shaped thick walled, curved and with distinct veins, 1/12 to ⅛ inch long. They have no prickles, are usually hairy, black when mature and contain only 1 seed.

The small seeds, also kidney-shaped are greenish yellow to brown about 1/16 to 1/12 inch long and very similar to alfalfa seed.

DISTRIBUTION—Black medic is a native of Eurasia. In Arizona it is primarily, as is bur clover, a nuisance in lawns where it thrives, and in alfalfa fields grown for seed. It is found as a weed almost throughout the state in moist often sterile soil along roadsides, in gardens, and waste places, mostly between 2,500 to 3,000 feet elevation; flowering from April to September.

Where black medic grows in pastures or uncultivated fields, it can scarcely be classed as a weed since it is so high in forage value.
PEA FAMILY

Leguminosae

WHITE SWEET CLOVER

Melilotus albus Desr.

A. Branch of plant
B. Inflorescence
C. Seed

OTHER COMMON NAMES — white melilot, honey clover, tree clover.

DESCRIPTION — A tall erect hairless annual or biennial, rarely perennial, reproducing only by seeds. The stem is erect branching above and 1 to 6 feet high. The leaflets are very similar to those of sour clover.

The flowers also are similar but are white instead of yellow and larger, about 1/5 inch long. They are likewise arranged in long narrow spike-like clusters along the upper half of the flower stalks but the stalks are 2 to 8 inches long.

The seed pods are slightly larger 1/12 to slightly more than 1/6 inch long. The seed is oblong to oval about 1/12 inch long notched near 1 end, yellowish green to brown, with the surface smooth not roughened.

DISTRIBUTION — White sweet clover also was introduced from Eurasia. As a weed it probably is most serious in alfalfa fields grown for seeds (particularly in Yuma county) also in other cultivated crops. It is a common weed in moist sandy soil throughout most of the state along roadsides, ditches, fences, and creeks, 100 to 7,500 feet elevation; flowering May until October.

Both white sweet clover and sour clover are excellent honey plants. The herbage is very fragrant when dried but has a peculiar odor when fresh. They rate high in forage value and animals soon acquire a taste for them.

Yellow Sweet Clover

Melilotus officinalis (L.) Lam.

Very similar to white sweet clover but the flowers are yellow and the stems are less erect and not as stout. Not as common nor as widespread in Arizona as sour clover or white sweet clover.
OTHER COMMON NAMES—annual yellow sweetclover, bitter clover, yellow melilot.

DESCRIPTION — An annual or biennial reproducing only by seeds. The main stem is erect with many spreading branches from above the base, 1½ to 3 feet high. The leaves are alternate and divided into 3 leaflets as in bur clover but are much larger. They are ½ to 1½ inches long, toothed above the middle with the tip indented or blunt.

The yellow flowers are sweetpea-like and less than ½ inch long. They are numerous and spike-like along the upper half of slender flower stalks, which are 2 to 4 inches long and arise from the upper leaf axils. The flower buds are erect but soon bend downward.

The small globeshaped seed pods are swollen on 1 edge, strongly wrinkled about 1/12 inch long and contain 1 or 2 seeds. The seed is somewhat eggshaped about 1/16 inch long, dark greenish brown with the surface honeycombed and roughened.

DISTRIBUTION — Sour clover, introduced from Eurasia, is often cultivated as a winter cover crop. It becomes a noxious weed when it spreads to the cultivated croplands in the irrigated areas.

As are bur clover and black medic, often it is a serious problem in alfalfa crops grown for seeds and also is a pest in lawns. It is found throughout the state in damp soil on bottomlands, gardens, roadsides, fields, ditches, and canals, 100 to 7,500 feet elevation; flowering March to September.
OTHER COMMON NAMES—purple loco, Lambert crazyweed, crazyweeds, white loco, rattleweed, stemless locoweed, mattockweed, point loco.

DESCRIPTION — A stemless hairy perennial from a woody branching base, reproducing only by seeds. There are no true stems and all the leaves come from the base of the plant. These are 3 to 10 inches long and divided once into 7 to 9 pairs of silky hairy leaflets ½ to 1 inch long.

The many flower stalks are 4 to 16 inches high nearly naked ½ of their length and bear numerous flowers on the upper part. The showy flowers are sweetpea-like commonly purple or sometimes white ½ to 1 inch long. The oblong woody seed pods are hairy, ¾ to 1¼ inches long, including the slender beak about ¼ inch long. The reddish brown somewhat kidney-shaped seeds are angular and flattened about 1/12 inch long.

DISTRIBUTION — Lambert loco is a native weed, growing in sandy or open slopes and plains in the yellow pine forests. It is very common and abundant in some areas where it has increased and spread on overgrazed and “sheeped out” areas in the pine ranges of northern Arizona, from Apache to Coconino counties and in the mountains of Greenlee, Graham, and Cochise counties, 5,000 to 8,000 feet elevation; flowering June to September.

POISONOUS PROPERTIES — Lambert or purple loco is one of the few important poisonous plants in the state. It (and a few other locoweeds) causes “locoism” in horses, cattle, and sheep. Poisoning in Arizona occurs principally among cattle in the spring, and losses have been reported from Navajo county, near Showlow, Snowflake, and Holbrook; also in the Graham mountains, Graham county.

Spotted loco, (Astragalus lentiginosus Dougl. var. diphysus (Gray) Jones) might also be involved since it is known to be poisonous and has about the same distribution as Lambert loco. Cattle losses caused by locoweed are also reported from the Canelo Hills, Sonoita, Patagonia and Elgin areas in Santa Cruz county. These are probably due to sheep loco (Astragalus notoxys Gray) since Lambert loco does not occur there.

Certain species of locoweed of the genus Astragalus are classed as seleniferous because they grow only in soils containing the mineral selenium. Selenium poisoning occurs in the Verde country in Yavapai county.
OTHER COMMON NAMES—western honey mesquite, velvet mesquite.

DESCRIPTION—A spiny deciduous shrub or small tree up to 30 or exceptionally 55 feet high with a trunk 1 to 4 feet in diameter. Usually armed with stout yellowish nearly straight spines arising in pairs, ½ to 3 inches long. The leaves 3 to 8 inches long are first divided into 1 to 2 pairs of primary divisions. Each of these is again divided into about 10 to 28 pairs of finely hairy or hairless oblong leaflets ½ to ¾ inch long.

The small fragrant greenish yellow flowers are crowded on stalked spikes 2 to 5 inches long. The flat tan colored leatherish pods are finely hairy or hairless, 3 to 8 inches long, the pulp sweetish. The rough bark separates into dark strips, and the wood is hard, reddish brown with thin yellow sapwood.

DISTRIBUTION — Mesquite is abundant throughout southern and central Arizona and also occurs in northern Arizona in Coconino and Mohave counties, 1,000 to 5,000 (rarely 6,000) feet elevation; flowering March to August, principally May and June. It is a common tree along the watercourses, washes, and alluvial bottoms where ground water is available. In some areas the roots may penetrate to depths of 60 feet.

Mesquite is abundant and has become a noxious range pest on the mesas and slopes of the deserts and desert grasslands, ranges and occasionally lower oak woodlands where it is often a shrub. The carrying capacity of many ranges has been seriously reduced due to its tremendous increase. Dissemination of the seeds in cattle dung has been an important factor in this invasion. Mesquite pods are relished by all livestock, which unlike other pea pods do not shed their seeds.

POISONOUS PROPERTIES — Horses are sometimes killed from eating mesquite beans. This is not due to a poison, but to the formation of large hard balls from the long tough stringy margins from green or rain soaked dried pods. Dried beans are not harmful as the thick fibers easily break into short pieces when eaten. Other livestock are not bothered.
DESCRIPTION — A low silky hairy silvery perennial reproducing by seeds and from deep horizontal rootstocks. The weak stems are often woody and branch at the base with some spreading and others erect, 2 to 12 inches long. The alternate leaves are 1 to 2 inches long and divided once into 4 to 12 pairs of small leaflets, ¼ to nearly ½ inch long, with fine silky hairs pressed close to the surface.

The white or yellowish white flowers are sweetpea-like ½ to ¾ inch long, and occur on short flower branches 2 to 5 inches long at the end of the stems. The seed pods are somewhat woody ½ to 1½ inches long, contain 1 to 4 seeds and are tipped by a sharp pointed beak. The pods are constricted between the seeds so each seed is clearly outlined. The seeds are kidney-shaped tan colored with the surface smooth and ½ to ¼ inch long.

DISTRIBUTION—Silky sophora is a native plant growing in colonies in sandy or heavy disturbed soil, as where floodwaters collect. It is abundant locally often covering extensive areas and becoming a noxious weed in cultivated fields, roadsides, and on the open ranges on sandy creek banks, in swales, and bottomlands. Found in northern Arizona from Apache to Mohave and Yavapai counties, also in Cochise and Pima counties, 3,500 to 7,000 feet elevation; flowering April to June.

Silky sophora is hard to eradicate because of its underground stems and should not be allowed to become established.

POISONOUS PROPERTIES — Silky sophora has long been suspected of causing livestock poisoning and the seeds are known to contain a poisonous alkaloid. Animals do not eat this plant and there is no livestock poisoning due to silky sophora in Arizona.
DESCRIPTION—A hairless perennial with prostrate stems reproducing by seeds and by means of creeping stems which root at the joints. The leaves are alternate and divided into 3 leaflets. The leaf stalks are long and erect although arising from the prostrate stems.

The flower stalks also erect and arising from the prostrate stems are much longer than the leaf stalks, 2 to 9 inches long. The flowers are crowded into globelike heads $\frac{1}{2}$ to $1\frac{1}{4}$ inches broad, at the end of the flower stalks. The sweetpea-like flowers are white or pink tinged and in age bend downward. The petals do not fall off but remain on the flower after withering. The small seed pod contains 3 to 4 seeds. The seeds are nearly globeshaped to kidneyshaped and about $1/16$ inch long.

DISTRIBUTION — White clover is introduced from Europe. It grows in moist soil and mostly is a pest in lawns in the northern part of the state and in the higher altitudes of southern Arizona. It also occurs in moist meadows in the yellow pine and spruce fir ranges where it can scarcely be classed as a weed (in the usual sense of the word) since it is so high in forage value.

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OTHER COMMON NAMES—alfilaree, alfilaria, pinclover, red-stem filaree, pinggrass, storksbill, heronsbill.

DESCRIPTION — A dark green annual, winter annual or biennial reproducing by seeds only. The many branched stems may be erect, spreading or prostrate with the tips ascending, ½ to 2 feet long often covering areas 2 to 3 feet or more in diameter. The leaves at first form a rosette close to the ground and are alternate, hairy and ½ to 4 inches long. They are divided into 3 to 7 or more pairs of stalkless leaflets which are further divided into many very fine segments.

The flowers are in an umbrella-like cluster at the end of long slender stalks arising from the leaf axils. The 5 rose purple petals are ½ inch or less long and drop off very quickly. The unusual long needlelike seed pods split into 5 one seeded parts at maturity.

The seed part is hard, spindle-shaped about 1/5 inch long with a very sharp pointed base. It ends in a slender wiry beak 1 to 1¾ inches long. These “tails” are tightly twisted and corkscrew-like when dry but uncoil when wet and can drive the seed into the hardest soil.

DISTRIBUTION—Filaree is native in Europe and probably was introduced by the Spaniards. It is common in moist soil and a nuisance particularly in winter lawns, also in flower beds, yards, gardens, fields, and roadsides below 5,000 feet elevation from February to May. Common in the same type of places from April to October at the higher elevations, about 5,000 to 7,500 feet.

It is abundant throughout the state on plains, mesas, and slopes 100 to 7,000 feet elevation; flowering February to July or to October at elevations to 8,500 feet or higher. Because of its abundance and high forage value filaree is a very important plant on many Arizona ranges during a short period in the spring.
WOODSORREL FAMILY
Oxalidaceae

CREeping Oxalis
Oxalis corniculata L.

A. Portion of plant
B. Fruit
C. Seed

OTHER COMMON NAMES—yellow oxalis, creeping woodsorrel, yellow woodsorrel, Lady's sorrel, sourgrass, sheepsour.

DESCRIPTION—A spreading to prostrate perennial with weak creeping stems, 3 to 8 inches long from a slender taproot. Reproducing by seeds, by the stems rooting at the joints and sometimes from slender underground rootstocks. The alternate leaves are divided into mostly 3 broadly heart-shaped leaflets borne at the tip of the long leaf stalks, which have sharp tasting juice. The green, purplish or bronze leaflets closing and drooping at night are hairless or thinly hairy.

The flowers have 5 yellow petals ½ to ¾ inch long. They occur in clusters of 1 to 5 at the end of a slender flower stalk arising from the leaf axils. The yellowish seed pods are erect but their short stalks are bent sharply downward. They are cylindrical, 5 angled, hairy, ½ to 1 inch long and pointed at the tip. When the many seeds are mature, the pods open explosively throwing the seeds some distance.

The tiny reddish brown seeds are somewhat egg-shaped but flattened, with 7 to 10 ridges on each face and about 1/25 inch long.

DISTRIBUTION—Creeping oxalis grows in dry or moist, usually shaded soil. Principally a nuisance in lawns, often found close to buildings, this European introduction can be very aggressive and persistent when it becomes established in a lawn. Common in northern and southern Arizona, 100 to 8,000 feet elevation; flowering February to November.

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CALTROP FAMILY

Zygophyllaceae

MEXICAN POPPY
Kallstroemia grandiflora Torr.

A. Flowering branch
B. Seed
C. Flowering branch of K. californica
D. Seed of K. californica

OTHER COMMON NAMES—Arizona poppy, summer poppy

DESCRIPTION — An erect, reclining or prostrate annual, covered with long rough yellowish hairs, reproducing only by seeds. The stiffly hairy stems branching from the base are ½ to 2 or more feet long. The leaves are opposite 1¼ to 3 inches long and divided into 5 to 7 pairs of smooth margined hairy leaflets.

The large flowers have 5 deep orange petals ½ to 1¼ inches long. They are solitary on slender stalks ¼ to 2 inches long in the leaf axils. The greenish, somewhat pear-shaped seed pods have cross ridges on the back and are tipped by a long beak ½ to ¾ inch long. The pods split into wedgeshaped seedlike parts at maturity. They are 3-angled about ½ inch long, the 2 faces brownish and netted veined.

DISTRIBUTION—This beautiful native plant is common and very colorful on sandy or gravelly soil on mesas, slopes, washes, roadsides, and bottom lands in southern and central Arizona, from Greenlee to Yavapai to Yuma counties and southward, 100 to 5,000 feet elevation, flowering February to September but mostly in July and August. It becomes troublesome when it spreads into adjacent cotton and other crop fields in the irrigated valleys. In rich soil, as in between cotton rows, the prostrate stems may be 4 feet long.

California Caltrop
Kallstroemia californica (Wats) Vail
An annual very similar to Mexican poppy but the petals are no longer than ¾ inch, the seed pod beaks are no longer than ½ inch and the backs of the seed pods have sharp tubercles. A native plant growing in the same type of places as Mexican poppy but found in northern as well as southern Arizona, 100 to 7,000 feet elevation; flowering May to October.
CALTROP FAMILY

Zygophyllaceae

PUNCTURE VINE
Tribulus terrestris L.

OTHER COMMON NAMES—bullhead, burnut, caltrop, Mexican sandbur, ground burnut, land caltrop, puncture weed.

DESCRIPTION—A prostrate silky hairy annual from a shallow taproot, reproducing only by seeds. The trailing stems, 1 to 5 (or to 8) feet long, branching and radiating from the root often from dense mats several feet in diameter. Or the stems may be nearly erect where growing in competition for light. The leaves are opposite, divided into 4 to 7 pairs of oblong leaflets \( \frac{3}{8} \) to \( \frac{1}{2} \) inch long.

The bright yellow flowers have 5 petals which are open only in the mornings. They are solitary on short stalks in the axils of the leaves. The seed pod consists of a cluster of 5 flat spiny burs. These break apart at maturity. Each part contains 2 or more seeds and has 2 strong vicious spines on its back.

Most of the burs are turned so they lie under the plant. The seeds may remain viable for many years until there is sufficient moisture for germination.

DISTRIBUTION—Puncture vine is native in Europe. It is an abundant and one of the most noxious weeds in southern Arizona but is found throughout the state. It is especially troublesome in lawns and cultivated fields, particularly alfalfa, gardens, roadsides, yards and walks, 100 to 7,000 feet or lower elevations; flowering March to October but principally in July and August.

It appears in remarkable numbers soon after the start of the summer rains on any type of barren soil along the city streets and yards in southern Arizona. It wet summers it is often covered by dodder (Cuscuta sp.). Each plant produces innumerable burs and it is almost impossible to prevent their falling on the ground once they are mature. Home owners and their dogs probably dislike puncture vine more than any other weed. The stout spines can easily penetrate shoes, bicycle tires and dogs' feet.
OTHER COMMON NAME— mercury weed.

DESCRIPTION—A weak annual 3 inches to 2 feet high reproducing only by seed. The bright green soft, lanceshaped leaves are alternate, shallowly toothed on the margins and 1 to 5½ inches long, including the slender stalks which are ½ to 2½ inches long. The entire plant often turns copper colored in the fall.

The small male flowers with 6 to 8 stamens and the female flowers with the 3 styles divided into numerous long threadlike pieces are found on the same plant or each may occur on separate plants. Beneath the female flowers are leaf-like bracts conspicuously veined, the tips long pointed. The 3 lobed seed pods are about 1/12 inch long and somewhat broader. The 3 plump granular, reddish or dark brown seeds are sometimes brown spotted, eggshaped, about 1/16 inch long.

DISTRIBUTION — New Mexico copperleaf is a native weed growing around drainage ditches, buildings, flower beds, edges of lawns, roadsides, and overgrazed areas on ranges, also found on shaded slopes and canyons in the mountains, Greenlee to Yavapai county and southward, 2,400 to 7,500 feet elevation; flowering August to October.
OTHER COMMON NAMES—
rattlesnake weed, white margin spurge, golondrina

DESCRIPTION—A prostrate hairless perennial forming mats to 3½ feet in diameter, reproducing by seeds and by frequent roots arising at the stem joints. The opposite hairless leaves ½ to ¾ inch long are smooth edged, often edged with white and red blotched in the center. At the base of the leaf stalk there is a thin whitish conspicuous structure. The 3-lobed seed pods are hairless and the whitish 4-angled seeds are about 1/16 inch long, the faces almost smooth.

DISTRIBUTION—A common native weed throughout most of Arizona and especially abundant in the southern part of the state. Found on dry barren disturbed soil along sidewalks, paths, waste places, roadsides, overgrazed or eroded areas around corrals, reservoirs, bedding places, washes and mesas, 100 to 7,000 feet elevation, flowering February to November.

Sawtooth Spurge

Euphorbia serrula Engelm

Sawtooth spurge also forms mats but is annual. The stems have long spreading hairs, and the pale green leaves either hairless or with a few long hairs, are sharply saw toothed along the edges. The whitish structures at the base of the leaf stalk are inconspicuous. A native weed with the same general distribution and habitat as whitemargin spurge but mostly between 2,400 to 8,000 feet elevation; flowering from May to November.

Littleleaf Spurge

Euphorbia micromera Boiss

OTHER COMMON NAME—
desert spurge

A short hairy or hairless mat forming annual, but the leaves very small 1/16 to ¼ (mostly ½ or less) inch long and the edges smooth. The whitish structures at the base of the leaf stalk are inconspicuous. A native weed found in the same type of places and the general distribution of whitemargin spurge flowering August to October.

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SPURGE FAMILY

Euphorbiaceae

PROSTRATE SPURGE

Euphorbia chamaesyce L.

A. Plant
B. Attachment of leaves to stem
C. Fruits
D. Seed

DESCRIPTION—A prostrate annual often forming mats, or sometimes partially erect where competing for light, reproducing only by seeds. The pinkish to bright red stems have short, spreading or curved hairs. The opposite leaves, green or purplish green are hairless above and thinly hairy beneath, \( \frac{1}{4} \) to \( \frac{1}{2} \) inch long with smooth or finely toothed margins. The 2 scale-like structures at the base of the leaf stalks are lacking or small and inconspicuous.

The tiny pinkish flowers consisting of stamens and pistils only are grouped into small flowerlike clusters. The 3-lobed seed pods are \( \frac{1}{16} \) inch or less long, hairy only on the 3 angles, the hairs short and usually stiffly spreading or lying close to the surface on some plants. The oblong seeds, about \( \frac{1}{25} \) inch long are sharply 4-angled and have 6 to 8 sharp cross wrinkles on each face.

DISTRIBUTION — Naturalized from Tropical America, prostrate spurge is one of the worst pests in summer lawns throughout southern Arizona. Also common along paths, roadsides, cracks in sidewalks, streets, gardens and flower beds; 100 to 5,500 feet elevation; flowering June to November.

Spotted Spurge

Euphorbia supina Raf.

OTHER COMMON NAMES — prostrate spotted spurge, milk purslane.

DESCRIPTION—Very similar to prostrate spurge but the leaves usually have a red blotch in the center. The structures at the base of the leaf stalks are branched threadlike and about \( \frac{1}{16} \) inch long. The seed pods and seeds are about the same size but the hairs lie flat on the surface and are almost evenly distributed. The seeds have 3 to 5 indistinct cross wrinkles on each face rather than 6 to 8 distinct ones.

DISTRIBUTION — Introduced from eastern United States, spotted spurge also is an aggressive and persistent pest in lawns and flower beds with the same habitat and general distribution of prostrate spurge.
SPURGE FAMILY
Euphorbiaceae

HYSSOP SPURGE
Euphorbia hyssopifolia L.

OTHER COMMON NAME—upright spurge.

DESCRIPTION—A slender erect hairless annual, often with many stiff spreading branches, 4 inches to 4 feet high in rich soil, reproducing only by seeds. The narrow oblong leaves are opposite and vary greatly in size. A few leaves scattered throughout the plant are at least twice the size of others. They are \( \frac{3}{4} \) to \( \frac{1}{2} \) inches long and \( \frac{1}{2} \) to \( \frac{3}{4} \) inch broad, the edges with short but sharp pointed teeth.

The 2 whitish inconspicuous structures at the base of the leaf stalks are finely shredded along the edges. The greenish 3-lobed seed pods are hairless, about 1/12 inch long and contain 3 seeds. The dark brown oblong seeds, slightly less than 1/16 inch long are 4-angled, 3 sharp and 1 rounded.

DISTRIBUTION — This native erect spurge is the most abundant and troublesome spurge in southern and central Arizona. It is a pest from late spring to late fall in all kinds of cultivated crops in the irrigated valleys. Also a nuisance in gardens, lawns, waste places and often occupying large areas on deteriorating ranges in scrub oak and juniper associations. Frequent along sandy washes and slopes, 100 to 6,000 feet elevation; flowering May to November, mostly August and September.

POISONOUS PROPERTIES OF SPURGES—All spurges contain a white, sticky milky juice which may cause skin inflammation in some humans and livestock. Livestock rarely eat these unpalatable plants unless they are fed in hay. Cattle have been poisoned from feeding on such hay over a period of time. No losses have occurred in Arizona, but inflammation of the mouth area is not uncommon.
DESCRIPTION — An erect branched annual ¾ to 3½ feet high reproducing by seeds. The leaves are alternate with stalks 1½ to 3 inches long. The blades are triangular in outline and may be somewhat arrowhead shaped, shallowly lobed with toothed margins, or the basal ones sometimes divided into several fingerlike lobes.

The large flower is solitary on a slender stalk arising at the base of the leaf stalk and has 5 purple or bluish violet petals ¾ to 1 inch long. The green outer flower parts persist, the 5 long lobes widely spreading under and greatly beyond the flattened disk of 9 to 20 seed-like pods, which separate at maturity. Each has a dark hardened spur along the back, sharp pointed and spine-like at the base, extending beyond the tip into a stiff bristle 1/12 inch or more long, and thinly covered with conspicuous yellowish hairs.

The dark gray seeds are wedge-shaped, about ¼ inch long and prickly tipped at the narrow end.

DISTRIBUTION—Spurred anoda is a native weed growing in moist soil, in cotton fields and other irrigated crops, gardens, ditches, roadsides, also along streams and meadows, mostly in eastern central and southern Arizona, from Apache to Yavapai county and southward 2,400 to 6,500 feet elevation; flowering August to October.
MALLOW FAMILY

Malvaceae

CHEESEWEED

Malva parviflora L.

A. Young plant
B. Unopened flower
C. Flower
D. Fruit
E. Seed

DESCRIPTION—A stout, bushy annual or biennial branched and spreading from the base, 1 to 3 feet high, from a short thick taproot reproducing only by seeds. The large soft leaves are alternate, almost circular, often with a red spot at the base, and usually 5 to 7 shallow lobes, the edges toothed. They are 2 to 5 inches broad on stalks more than twice as long as their length.

The inconspicuous flowers are nearly stalkless, in small clusters at the base of the leaf stalks and at the top of the plant. There are 5 bluish or pinkish petals about \( \frac{1}{4} \) inch long. The outer green flower parts persist with the 5 lobes spreading under or about the disk of 11 to 12 seedpods. This disk resembles a round cheese divided into 11 or 12 sections, from which it derives its common name.

When mature these separate into 11 or 12 seedlike sections. Each is almost circular with a notch on 1 edge, 1-seeded, flattened, with radiating ridges on the 2 sides and the back sharply roughened. The reddish brown seeds are similar in shape but the surface is smooth, about 1/12 inch long.

DISTRIBUTION — Introduced from Europe, cheeseweed is common throughout the state in somewhat moist loam soil. Especially troublesome in irrigated lands, i.e., cotton fields, lawns, orchards, yards, flower beds, waste places and city streets, at 100 to 8,500 feet elevation; flowering March to October, mostly until June at the lower elevations except in moist irrigated places. The plant and seeds are reported to cause pink egg whites when eaten by hens.

Roundleaf Mallow

Malva neglecta Wallr.

OTHER COMMON NAMES— dwarf mallow, cheeses, low mallow, running mallow.

Very similar to cheeseweed but the stems are spreading or nearly prostrate and the petals are larger, \( \frac{3}{4} \) to \( \frac{3}{2} \) inch long. Found in the same type of places as cheeseweed but mostly in northern and central Arizona; flowering May to September.
MALLOW FAMILY

Malvaceae

TUBEROUS SIDA

*Sida physocalyx* Gray

A. Root
B. Branch
C. Hair

**DESCRIPTION** — A low perennial, the branches nearly erect or spreading at the base and reclining on the ground ½ to 2 or 3 feet long reproducing only by seeds. The tap-root is unusual, spindleshaped and tuberlike about 3 or 4 inches long. The alternate leaves are lance-shaped or broadly oblong, deep green and hairy with toothed margins, stalked. The cream yellow flowers arise from the leaf axils. The outer green flower parts persist, become much enlarged, papery, and 5-angled.

**DISTRIBUTION** — Tuberous sida is a common native plant which frequently becomes a nuisance in yards, flowerbeds, and cultivated fields in southern and central Arizona, 2,500 to 5,000 feet elevation; flowering March to October.

**Alkali Mallow**

*Sida leprosa* var. *hederacea* *(Doug.) K. Schum.*

**OTHER COMMON NAMES** — creeping mallow, star mallow, white mallow, whiteweed, melon-cilla, alkali sida.

**DESCRIPTION** — A low whitish or yellowish perennial densely covered by short yellow forked hairs, reproducing by seeds but mostly by long slender woody rootstocks. The stems are partially erect to prostrate ½ to 1½ feet long. The leaves are rounded with toothed margins ½ to 2 inches broad on stalks ½ to 1 inch long.

The flowers are cream colored when fresh often fading pink. They mostly occur singly in the leaf axils and are ⅛ to ⅜ inch long. The seeds seldom mature because of insect attacks.

**DISTRIBUTION** — Alkali mallow also is a native plant. It is troublesome in cultivated lands and dry ditch banks, particularly in heavy alkaline bottomland soil. Common from Apache to Coconino county and southward, mostly 100 to 5,000 feet elevation; flowering May to October.
OTHER COMMON NAMES—tamarix, salt cedar, 5-stamen tamarisk.

DESCRIPTION—A beautiful shrub or small tree especially in flower, reproducing by seeds. The long slender grayish green branches are upright or spreading, often forming shrubby thickets many feet in diameter, mostly to 10 to 12 (or to 15) feet high. The small grayish green, narrow pointed leaves about 1/16 inch long, are crowded on the stems often overlapping one another. They have the appearance of evergreen leaves but actually are deciduous.

The myriads of little flowers, from deep pink to nearly white are about 1/16 inch in diameter and crowded in many slender spikes ½ to 2 inches long, forming a dense showy mass at the top of the branches. The slender tapering many seeded pods are pinkish red to greenish yellow, ½ to nearly 1/5 inch long, splitting into 3 to 5 parts when mature.

The tiny seeds are less than 1/25 inch long and have a tuft of fine silky hairs at the tip. The bark is reddish brown and fairly smooth at first but becomes ridged and furrowed.

DISTRIBUTION—Tamarisk was introduced from Eurasia but soon escaped cultivation. Now it is abundant in the bottomlands, banks, and drainage washes of all the rivers and other watercourses throughout the state including the irrigation ditches and the Grand Canyon. It is very drought-resistant and grows in all types of soil including alkali and salty soil. Found principally in deserts and desert grasslands at 100 to 5,000 feet elevation or sometimes to 6,000 feet in northern Arizona, as in Canyon de Chelly (Apache county), where it is common; flowering March to September.

At one time tamarisk was looked upon with favor as a check to erosion, as a windbreak, and as a source of honey, but now its abundance makes it a nuisance in the big rivers and robs them of an alarming amount of water each year.
EVENING PRIMROSE FAMILY

Onagraceae

VELVET WEED

*Gaura parviflora* Doug.

A. Plant
B. Flower
C. Fruit

OTHER COMMON NAME—velvety gaura.

DESCRIPTION—A tall upright annual, winter annual or biennial from a thick taproot, reproducing only by seeds. There is 1 principal stem, 2 to 6 feet high, usually branching above the middle and covered with fine silky stiff hairs. The leaves first form a rosette on the ground. The stem leaves are alternate, nearly stalkless, lance-shaped and soft hairy, 2 to 4 inches long.

The small pink or reddish flowers with 4 petals 1/16 to 1/12 inch long, are stalkless and crowded on long branching flower spikes at the top of the plant, 2 inches to 18 inches long. The hard woody seedpods are greenish, ¼ to ½ inch long, ribbed and usually hairless or occasionally short hairy. They are spindleshaped, pointed at both ends and contain 2 to 4 seeds which are not shed at maturity.

DISTRIBUTION—Velvet weed is a native western weed which is common throughout Arizona in moist soil of cultivated lands, (as in cotton fields in Yuma valley), old fields, roadsides, barren areas on overgrazed flats in the higher desert grasslands or sandy river washes, 100 to 6,800 feet elevation; flowering April to October.
DESCRIPTION—A slender hairless annual, the weak stems erect or spreading, ½ to 2 feet high, reproducing by seeds only. The delicate alternate leaves are divided and redivided into many very narrow to threadlike segments and are widely spaced on the stems.

The tiny white flowers are in small umbrellalike clusters opposite the leaves and at the top of the plant. The flattened oval seeds (fruits), 1/16 to 1/12 inch long, have 5 or 6 prominent ribs on each face.

DISTRIBUTION—Wild celery is native from southern United States to South America. It is principally a troublesome weed in lawns and although annual, very persistent. Constant mowing causes it to branch often but does not otherwise affect it. Common throughout southern Arizona and abundant in certain areas, 100 to about 5,000 feet elevation; flowering March to September.
DESCRIPTION—A delicate annual with short forked hairs, branching and flowering from the base, reproducing only by seeds. The weak stems are nearly erect or trailing on the ground, \( \frac{1}{4} \) to 2 feet long. The thin opposite leaves are mostly 5-lobed (or 3 to 7), broader than long \( \frac{1}{2} \) to 1 inch broad on slender stalks \( \frac{1}{2} \) to 3 inches long.

One to 4 tiny greenish white flowers occur at the base of the leaf stalks. The rounded seeds are about \( \frac{1}{16} \) inch long, with no ribs on the faces.

DISTRIBUTION — Hairy bowlesia is an insignificant native weed occurring in shady places in moist or dryish, often barren soil around buildings, yards, waste places and under bushes or rocks in sandy washes, desert mesas and slopes, from Mohave and Coconino counties southward, 100 to 3,500 feet elevation; flowering January to May.
DESCRIPTION—A robust, very leafy perennial with milky juice, reproducing by seeds and by horizontal rootstocks. There is 1 stout erect stem often hollow, unbranched or few branched, 1½ to 3½ feet high. There are 5 or more pairs of large thick oval leaves, conspicuously veined, almost stalkless, often as broad as long and rarely more than 1½ times as long as broad, the tip broadly rounded and often indented.

The fragrant yellowish flowers, on slender stalks from drooping umbrellalike clusters at the tops of the branches and in the leaf axils. Two to several smooth brown, woody seed pods are produced on stalks that curve downward. They are about 3 inches long and 1½ inches broad when mature and contain many flattened seeds. These are distinctly margined, reddish brown and about ½ inch long, ¼ inch broad.

Each seed has a tuft of fine silky white hairs at the narrow end and is about 1 inch long.

DISTRIBUTION—BROADLEAF MILKWEED is a native plant growing in dry soil on mesas, plains, washes, and often abundant along trails and roadsides in the northern desert and short grassland ranges of northeastern and central Arizona. Found from Apache to Coconino and Yavapai counties, 3,000 to 7,000 feet elevation; flowering from June to August, fruiting until October. This plant tends to increase in heavily grazed areas.

POISONOUS PROPERTIES — The green plants before and during the flowering stage are poisonous to sheep, cattle and goats. Poisoning has occurred early in the spring before the grass had started to grow.
MILKWEED FAMILY

Asclepiadaceae

HORSETAIL MILKWEED

Asclepias subverticillata (Gray) Vail (A. galioides)

A. Flowering branch
B. Flower
C. Opening pod
D. Fruit

OTHER COMMON NAMES—whorled milkweed, poison milkweed, bedstraw milkweed, beeweed.

DESCRIPTION—An erect bushy, hairless perennial with milky juice, reproducing by seeds and by wiry creeping rootstocks. There are many slender unbranched stems 1 to 4 feet high, arising close together from the underground stems giving large plants a shrubby appearance. Three (sometimes 2 or 4) long narrow leaves are found at each stem joint. These are 3 to 5 inches long, nearly stalkless, not over ¼ inch broad and usually less, with the edges slightly rolled backwards.

The small greenish white flowers occur in small umbrellalike clusters at the top of the branches and in the leaf axils. The slender seedpods are 1 to 3 inches long spindle-shaped and long pointed, their stalks are usually erect, not curved downward. The seeds are similar to those of broadleaf milkweed but slightly smaller.

DISTRIBUTION—Horsetail milkweed is native in western United States and Mexico. It grows in dryish soil along roadsides, edge of fields, and pastures, ditch banks, plains, mesas and slopes. Found throughout most of the state on practically all types of ranges from desert to spruce fir it is probably most common in yellow pine, 2,500 to 8,500 feet elevation; flowering May to September.

POISONOUS PROPERTIES—All parts of horsetail milkweed above the ground are poisonous at all times, even when dried. It is poisonous to all classes of livestock but particularly to sheep. None of the milkweeds are palatable to livestock and animals will rarely touch them if other forage is available.
DESCRIPTION — A perennial with milky juice and long twining stems 8 to 40 feet long, reproducing by seeds and by creeping rootstocks. The leaves are in pairs, thinly covered by short hairs to hairless.

The various plants show remarkable variability in the size and shape of the mature leaves. They all have slender stalks but these vary in length from 1/16 inch to over 2 inches. The leaf blades are very narrow 1/16 inch to broad, 1 3/4 inches. The leaf base may be narrowed to a point and taper into the stalk, or they may be rounded, or 2-angled, or heart-shaped, or arrow-shaped, or 2-lobed with the lobes pointing outward. They may be narrowed to a long slender point at the tip, or short pointed, or rounded with a point tip. They are ½ to 2 ½ inches long.

The flowers are in characteristic umbrellalike clusters with 15 to 25 on a slender stalk arising at the leaf axil. They are fragrant, white, whitish yellowish or purplish. The brown seed pods are 1 ½ to 3 ½ inches long, ½ to ¾ inch in greatest width. The reddish brown seeds are ½ to ¾ inch long slightly toothed at the rounded end, with a tuft of soft silky hairs at the narrow end.

DISTRIBUTION—Climbing milkweed is a native weed growing in dry sandy soil and a common nuisance around ranches, often climbing on fences, ditches, small trees, shrubs, and spreading into gardens and cultivated fields. Also common in desert washes, and arroyos, throughout southern and central Arizona 100 to 5,000 feet elevation; flowering April to September, the seed pods persisting until November.

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MORNING GLORY FAMILY

Convolvulaceae

FIELD BINDWEED

*Convolvulus arvensis* L.

OTHER COMMON NAMES—wild morning glory, orchard morning glory, field morning glory, corn-bind, bearbind, European morning glory, European bindweed, creeping Charley, creeping Jenny, greenvine.

DESCRIPTION—A prostrate perennial from a thick, branching, deeply penetrating taproot, reproducing by seeds and by extensive creeping rootstocks. The slender twining or trailing on the ground are 1 to 3 (or 10) feet long. The leaves are alternate on stalks \( \frac{1}{4} \) to \( \frac{3}{4} \) inch long.

The leaf blades are eggshaped with the base squarish, heartshaped, arrowshaped or the 2 lobes pointing outward. They are \( \frac{1}{2} \) to \( \frac{3}{4} \) inches long, \( \frac{3}{8} \) to 1 inch broad and usually roundish at the tip.

The funnelshaped flowers are white or pink, \( \frac{3}{4} \) to 1 inch long, and \( \frac{3}{4} \) to 1 inch across. They occur singly (sometimes 2 or 3) on stalks 1 to 2 inches long in the leaf axis. A pair of narrow pointed bracts \( \frac{3}{8} \) to \( \frac{1}{2} \) inch long occur on the flower stalks \( \frac{1}{2} \) to 1 inch below the flower.

The globeshaped, point-tipped seedpods contain 4 chocolate brown seeds. These are somewhat egg-shaped, the surface roughened, 3-angled, or flat on 1 side and rounded on the other, \( \frac{1}{8} \) to 1/5 inch long.

DISTRIBUTION — Introduced from Europe, field bindweed grows mostly in dry soil along roadsides, in open fields or edge of cultivated fields, pastures, on fences, yards and waste places of farms. Common throughout the state 100 to 8,500 feet elevation; flowering April to August. Considered the most noxious of all weeds in several western and midwestern states, this drought resistant plant with its unusual root system is almost impossible to eradicate from an infested area.

Hedge Bindweed

*Convolvulus sepium* L.

OTHER COMMON NAMES—bracted bindweed, great bindweed.

Similar to field bindweed but the 2 bracts, large, \( \frac{1}{2} \) to 1 inch long and enclosing the flower, not below it. The flowers are larger \( 1 \frac{1}{2} \) to 2\( \frac{1}{2} \) inches long and the leaves also are larger, 2\( \frac{1}{2} \) to 3\( \frac{1}{2} \) inches long.

Not common in Arizona except locally in somewhat moist soil, from Apache to Coconino county 6,000 to 7,000 feet elevation; flowering June to August.
OTHER COMMON NAMES—lovevine, strangleweed, devil hair, hairweed.

DESCRIPTION—A parasitic rootless, leafless annual vine with beautiful yellow or orange, stringlike, twining stems, reproducing only by seeds. The leaves are reduced to colorless scales and the plant has no green matter. Upon germination the long slender seedling, at first dependent upon food stored in the seed, coils about an available plant to which it becomes attached by numerous suctionlike suckers. It now depends upon its host for all food. Should the seedling fail to reach a host it soon dies.

The stems branch greatly forming a network about the host and spread on to the next plant, the growing parts continually producing new suckers. Although branches of the host or the entire host may die the only part of the vine that dies is that portion directly attached to lifeless material.

The white or cream colored flowers are bellshaped, fleshy, mostly 5-lobed 1/12 to 1/4 inch long and arranged in clusters along the stems. The globeshaped seedpods are thin and paperish, producing 2 to 4 seeds.

DISTRIBUTION — Dodder is a noxious weed sometimes parasitizing important crops, particularly alfalfa and clover with whose seeds it is often mixed. Of the 15 species in Arizona only 3 are common, ranging from Coconino and Yavapai counties southward, 100 to about 5,000 feet elevation; flowering June to November but mostly July to September.
OTHER COMMON NAME —
star glory.

DESCRIPTION — A hairless an-
nual with ridged, often reddish
stems, twining or trailing on the
ground, reproducing only by seeds.
The alternate leaves, on stalks 1
to 4 inches long are of 2 principal
shapes. On some plants they are un-
lobed with the base deeply heart-
shaped and the tip conspicuously
long pointed, 1 1/2 to 2 1/2 inches long.
On other plants some or all of the
leaves are deeply cut into 3 to 5
fingerlike lobes.

The scarlet red flowers easily
separate red morning glory from
all other Arizona species. (Others
are pink, purple, blue, or white.)
They are narrowly trumpetshaped
1 to 1 1/4 inches long and 1 1/2 (or 1 3/4)
inches across. Two to several flowers
are borne on a long stalk, 3 to 5
inches long arising from the leaf
axils

DISTRIBUTION — Red morning
glory is native in Arizona, New
Mexico and in tropical America.
It is a pest in cotton fields and other
commercial croplands in southeastern
Arizona from Apache to Cocopa-
no county and southward. Par-
ticularly noxious in Graham county
(around Safford and Thatcher) and
in Santa Cruz county. Often found
along road sides, ditches, sandy
washes, hill sides and canyons 2,000
to 7,000 feet elevation; flowering
May to October.

All species of morning glory are
most harmful in cotton fields after
the cultivating period is over. They
grow unchecked then and wind
about the plant, the flower, and
boll.

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DESCRIPTION—An annual with twining or trailing stems, all parts hairy, reproducing by seeds only. The leaves are of 3 principal shapes on stalks 2 to 4 inches long. Some are unlobed, heartshaped and very similar to the leaves of tall morning glory. Others vary from barely angulate 3-lobed to very deeply 3-lobed, with conspicuously heart-shaped bases, 1½ to 4 inches long. A few may be divided into 5 fingerlike lobes.

The flowers are blue, purple or whitish, and as in other morning glory flowers, opening early in the morning soon closing under the sunshine. They are 1 to 1½ inches long and in clusters of 1 to 5 on the long flower stalk. The outer 5-lobed flower parts (Calyx) are conspicuously hairy at the base; these ¼ to ½ inch long or in some plants are much longer and up to 1 inch long.

The globeshaped seed pod is yellowish and contains 4 seeds. The seeds are similar to those of red morning glory but larger, about 1/5 inch long, dark reddish brown, minutely hairy and more flattened.

DISTRIBUTION — A native of tropical America, Mexican morning glory is the most noxious of the 3 species in Arizona. Widely distributed throughout the central and southern part of the state, infrequent northward, it is abundant in cultivated lands. Especially troublesome in cotton, soybeans, and corn fields, roadsides, and sometimes in pinyon and yellow pine forests, from 100 to 7,000 feet elevation; flowering from July to November. Around St. David (Cochise county) after the onset of the heavy summer rains it covers more than a 1000 acres, mostly lying flat on the ground. It is one of the worst late cotton pests in the Safford (Graham county), Avra, Santa Cruz (Pima county) and Yuma valleys.
OTHER COMMON NAME — common morning glory.

DESCRIPTION — An annual climbing and twining vine, from a fibrous root system, reproducing only by seeds. The twining or trailing stems are hairy, 5 to 13 feet long. Similar to Mexican morning glory but the leaves are all heart-shaped and unlobed, more or less hairy, and pointed at the tip, the blades 2½ to 4 inches long, on long stalks 2 to 4 inches long.

The flowers are similar to but often larger than those of Mexican morning glory. They are white to blue or purple to bright pink with considerable variation and different markings. 1½ to 2½ inches long and 1½ to 2 inches across. The outer greenish, 5-lobed flower parts (calyx), as in Mexican morning glory are conspicuously hairy, ½ to ¾ (or rarely 1 inch) long.

The globeshaped seedpods are like those of red morning glory. The seeds are similar but flattened and larger about 1½ inch long and minutely hairy except around the scar.

DISTRIBUTION — Tall morning glory is native in tropical America. It occurs with Mexican and red morning glory on the farms, roadsides and ditches in central and southern Arizona; flowering July to October.
OTHER COMMON NAMES— fiddleneck, yellow tarweed, yellow burweed, yellow burnweed, yellow forgetmenot, fingerweed.

DESCRIPTION—A conspicuously bristly yellowish annual, covered by stiff harsh hairs, reproducing only by seeds. The stems are erect, branching \( \frac{1}{2} \) to 2\( \frac{1}{2} \) feet high, often falling on the ground in age. The alternate rough hairy leaves are lanceshaped to oblong, stalkless or nearly so, 1 to 3 (or exceptionally to 8) inches long, \( \frac{1}{2} \) to \( \frac{1}{2} \) (or to 1) inch broad.

The slender yellow or orange yellow flowers, \( \frac{3}{4} \) to \( \frac{4}{5} \) inch long are crowded on 1 side of long, curling spikes 3 to 10 inches long. The 5-lobed outer flower parts (calyx) are bristly yellow hairy, and enclose the 4 seedlike nutlets.

Each nutlet contains 1 seed and is usually referred to as a seed. They are grayish, somewhat egg-shaped but 1 end pointed, 1/12 to \( \frac{1}{8} \) inch long. They have a sharp ridge down the back, a slightly winged angle underneath and are covered by grayish pebblelike bumps.

DISTRIBUTION—A native weed, coast buckthorn often is a nuisance in winter grain fields, along road-sides, and waste places. It is abundant on dry sandy or gravelly soil on the creosote desert ranges from Coconino and Mohave counties southward to Yuma and eastward to Cochise counties, mostly below 5,000 feet elevation; flowering February to May. It is relished by livestock when young and in years of good winter moisture may form an important part of the spring forage on desert ranges.

POISONOUS PROPERTIES—The mature seeds have been demonstrated to cause hepatic cirrhosis, known as "hard liver disease" of cattle and swine and the "walking disease" of horses. Sheep are either immune or highly resistant to the poison. The disease is common in the Pacific Northwest but not in Arizona.
OTHER COMMON NAMES—salt heliotrope, seaside heliotrope, Chinese pusley, whiteweed, devilweed, quail plant, yerba del torojo.

DESCRIPTION — A low bluish green, fleshy perennial, reproducing by seeds and by creeping rootstocks. The plant is hairless but covered with a whitish bloom that rubs off easily. When picked it soon turns dark purplish brown. The stems branch from the base, usually are erect at first but soon prostrate, with the tips ascending, 1 to 3 feet long. The leaves are alternately rounded at the tip, 1 to 2½ inches long, the upper stalkless and the lower with short stalks.

The flowers are white with a yellow "eye" changing to purple, ¼ to ½ inch long, crowded on 1-sided, slender curling spikes which are mostly in pairs, 2 to 6 inches long. The globeshaped seedpod separates into 4 seedlike parts when mature.

The small brown seeds, about 1/16 inch long are beetleshaped, rounded on the back with several raised longitudinal veins.

DISTRIBUTION—A native weed, alkali heliotrope is common in moist alkaline or saline soils and along watercourses. Often a pest in plowed fields particularly on overflow bottom lands, irrigation ditches, canals, and roadsides from whence it spreads along the edges of cultivated crops. Abundant in the valleys, along the banks, and overflow lands of the Colorado, Little Colorado, Salt, and Gila rivers, throughout Arizona from 100 to 6,000 feet (mostly lower) elevation; flowering throughout the year. Usually growing in dense colonies due to spreading from its extensive rootstocks.
OTHER COMMON NAMES — dead nettle, blind nettle, bee nettle, giraffe head.

DESCRIPTION — A low slender annual, winter annual, biennial, or rarely a shortlived perennial, reproducing by seeds, by stems rooting at the lower joints, and sometimes by slender rootstocks. The weak 4-angled stems, 4 to 16 inches high, branching from the base, are erect at first but soon spreading, the lower part often reclining on the ground and rooting at some joints.

The leaves are opposite, usually less than 1 inch long, hairy, and round-toothed or lobed. They are widely spaced except at the tops of the stems, often 3 to 6 inches apart. The lower ones are heart-shaped on slender stalks, the upper ones much broader, stalkless and clasping the stem.

The slender pink or purple flowers, ½ to ¾ inch long, are tubular with 2 lips, the upper hairy on the back and the lower spotted. The stalkless flowers are borne in the axils of the upper leaves, 6 to 10 or more forming a circle around the stem. The outer greenish flower part (calyx), yellow hairy with 5 sharp bristlelike teeth, remains on the plant and encloses the 4-lobed seed pod. This separates into 4 seedlike nutlets, commonly referred to as seeds. They are 3-angled, 1/16 to more than 1/12 inch long, grayish brown, and sprinkled with silverish bumps.

DISTRIBUTION — Henbit is an introduced European weed, growing in moist often shady soil, but also in the sun. In Arizona it is primarily a pest in lawns, especially new lawns, also found in gardens, flowerbeds, plowed fields and waste places. Troublesome mostly in the spring and sometimes again in the fall at the lower elevations.

Widespread throughout the southern and central part of the state and locally abundant in many areas, it is scattered in the northern part, 100 to 9,000 feet elevation; flowering February to November.
OTHER COMMON NAMES — houndsbane, marrube, marvel.

DESCRIPTION — An upright bushy perennial with densely white woolly, 4-angled stems branching from the base, ¾ to 2½ feet high, reproducing by seeds only. Both the stout stems and the leaves have a very bitter taste. The opposite leaves are roundish, corrugated, 1 to 2 inches long including the stalks. They are green above, white woolly beneath with rounded teeth along the margins.

The small white tubular flowers, ¼ to ½ inch long are crowded into dense clusters around the stem at the base of the leaf stalks. The flowers are stalkless and the clusters are very dense and compact around the stem. These flower groups occur at the ends of all the branches and often extend for more than a foot on the stem. The outer green flower parts (calyx) are also tubular, with 10 spinelike teeth which curve downward and are hook-tipped in age. These are persistent and enclose the 4-lobed seedpods.

At maturity the seedpod separates into 4 seedlike nutlets which are 1-seeded and commonly referred to as the seeds. They are eggshaped, brown or dark gray, about 1/12 inch long, somewhat 3-angled and the surface with scattered darkish granules.

DISTRIBUTION — Horehound is a widespread European perennial. It grows in dry soil and is a common weed of old fields, waste places, roadsides, and especially in the vicinity of permanent stock water, bedgrounds, and sheep or goat corrals. It extends throughout the state and is abundant in many areas. It has a wide altitudinal variation from 100 to 8,500 feet elevation; flowering May to October.

The hooked teeth of the outer flower parts containing the seeds become attached to and lower the value of wool or mohair. The tops of the plants are used medicinally for cough medicines and for candy flavoring.
DESCRIPTION — Low spreading perennial, reproducing by seeds and by slender rootstocks. The plants are covered by whitish branlike flakes which actually are flat branched hairs. The weak stems branching from the base are erect at first but soon spreading and reclining on the ground, ½ to 1½ feet long. The alternate leaves 1 to 4 inches long, 1/12 to ½ inch broad are short stalked or stalkless. They are narrowly lance-shaped with nearly smooth margins or more often are shallowly and irregularly lobed.

The 5-lobed flowers are greenish white or tinged with purple, wheel-shaped and ½ to ¾ across. They occur singly in the leaf axils all over the plant not just on the upper part, and are on slender stalks, which curve downward in fruit. The outer green flower part (calyx), is 5-lobed and persistent, enlarging and becoming globe-shaped but only covering about ¾ of the mature seedpod.

The yellowish berry-like seedpods with the surrounding greenish calyx are about ¾ inch in diameter and hang downward. The kidney-shaped seeds, slightly more than 1/12 inch in diameter are dark brown or reddish brown, the surface honey-combed, roughened, and glistening.

DISTRIBUTION — Small ground-cherry is a native weed, growing on dry or damp disturbed soil, in cultivated farm lands, fields, edge of walks or lawns, yards, and roadsides. Also found on mesas, bottoms, and especially on eroded or overgrazed plains on northern desert and pinyon juniper ranges. Widespread throughout most of Arizona but especially in the northern and central parts, where it is abundant in many areas, 2,500 to 7,500 feet elevation; flowering April to September. The Navajo and Hopi Indians are reported to eat the seedpods.
POTATO FAMILY
Solanaceae

DESERT THORNAPPLE
Datura discolor Bernh.

A. Branch
B. Fruit
C. Seed

DESCRIPTION — An erect low annual with stout stems branching from the base 1 to 2 feet high, reproducing only by seeds. Very similar to sacred datura but smaller in all parts and the plants are greener, not gray hairy. The leaf blades only about 2 to 4 inches long are slightly more rounded.

The flowers are trumpetshaped, white tinged with violet, mostly 2 to 4 inches, rarely to 6 inches long, 2 inches or less across and the margin with 10 slender teeth rather than 5. The outer green flower part (calyx) is 2½ inches long and is 5-angled while that of sacred datura is 3 to 4 inches long and rounded, not 5-angled.

The large globeshaped seedpods, 1 to 1½ inches in diameter at maturity, are on thick down curved stalks. The many-seeded pods are covered by stout spines, the longer ones ½ inch long when mature. They are sticky and short hairy, as are the spines.

The ripe seeds are black about ½ inch long, kidneyshaped, flattened, the surface finely roughened, pitted, and bordered by a wavy grooved margin.

DISTRIBUTION — Desert thornapple is a native weed, growing in the same type of places as sacred datura and also is very common in cultivated fields in some areas, as in the Yuma Valley. It is confined to southern Arizona, mostly between 100 to 2,600 feet, sometimes to 4,000 feet elevation; flowering July to November.

POISONOUS PROPERTIES — (See discussion under sacred datura.)

Jimson Weed
Datura stramonium L.

OTHER COMMON NAMES— Jamestown weed, stramonium.

A large coarse annual about the size of sacred datura but green and hairless, and the flowers small like those of desert thornapple. It differs from both in that the seedpods are erect, hairless, and few-spined. Introduced from the tropics, jimson weed is common throughout the United States but only occasional in Arizona. Known only from Cochise and Gila counties but undoubtedly more widespread.
POTATO FAMILY

Solanaceae

SACRED DATURA

*Datura meteloides* DC.

A. Branch with flowers
B. Fruit
C. Seed

OTHER COMMON NAMES—tolguacha, Indian apple, moon lily.

DESCRIPTION — A large conspicuous grayish green perennial with a strong disagreeable odor forming spreading clumps, reproducing by seeds only. The coarse grayish stems are erect but spreading, branched from the base 2 to 3 feet high and often that in diameter. The large eggshaped leaves are alternate, on stout grayish stalks 1 to 5 inches long. The leaf blades, green above grayish hairy beneath, are 3 to 10 or more inches long, the edges wavy toothed and the tip pointed. The veins are whitish and obvious particularly underneath.

The large showy flowers are white or pale lavender, short stalked and very fragrant. They are broadly funnelshaped, 6 to 10 inches long and 3 to 6 inches across, with 5 slender teeth ½ to ¾ inch long. The numerous flowers are borne singly in the forks of the stems, open early in the evening and close sometime before noon of the next day.

The hard, globeshaped seedpods and seeds are very similar to those of desert thornapple but the spines are slender, less than ⅛ inch long, and the seeds are a light yellowish brown color.

DISTRIBUTION—Sacred datura is a native perennial weed growing in dry sandy and gravelly soils. It seldom grows densely but is found widely scattered along roadsides, ditches, corrals, farms, waste places, and in washes, arroyos, or slopes, on the desert and pinyon juniper ranges. Found throughout most of the state, 1,000 to 7,000 feet elevation; flowering May to October.

POISONOUS PROPERTIES — All parts of the plant of the various species of *Datura* are poisonous, the seeds being the most toxic and the young leaves next. They are poisonous to all classes of livestock but under range conditions the plants cause little trouble. Animals will not eat them unless forced to through starvation or confinement within heavily used pastures or corrals. The seeds and other parts of sacred datura are reported to be used by the Indians for medicinal purposes and the roots as a narcotic to induce visions.

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DESCRIPTION — An evergreen bluish green shrub or small tree 6 to 12 (or to 21) feet high, reproducing only by seeds. The stems are slender and loosely branching. The evergreen leaves are alternate, \(1\frac{1}{2}\) to 6 inches long, \(\frac{3}{4}\) to \(3\frac{1}{2}\) inches broad and on stalks \(\frac{3}{4}\) to \(2\frac{3}{4}\) inches long. They are bluish green egg-shaped, hairless but covered with a whitish powder which rubs off easily, and the margins are smooth or slightly wavy.

The long tubular flowers are yellow about \(1\frac{1}{2}\) inches long and are borne on large leafless branches at the ends of the stems. The flower tube is densely short hairy on the outside and opens during the day but the 5 lobes are very short so there is little spread. The outer green flower part (calyx) is unequally 5-toothed and about \(\frac{3}{4}\) to \(\frac{1}{2}\) inch long.

The seedpods are brown, many seeded, \(\frac{3}{4}\) to \(\frac{1}{2}\) inch long, somewhat eggshaped or oblong, on curving stalks so they hang downward.

The kidney-shaped seeds are dark brown about \(1/16\) inch long, the surface honeycombed and roughened.

DISTRIBUTION — Tree tobacco is a naturalized range shrub from South America. It grows in sandy or gravelly soils along roadsides, near cultivated areas, in wasteplaces, around old dwellings, and ditch banks. It is common throughout the desert ranges in southern Arizona along streams, washes, and dry watercourses, 100 to about 3,000 feet elevation; flowering practically the year around.

POISONOUS PROPERTIES — As in desert tobacco the leaves and young stems of tree tobacco are the most toxic parts of the plant. The plant is poisonous to all kinds of livestock when force fed but under range conditions losses have been confined mostly to cattle.
DESCRIPTION — A sticky, soft hairy annual, or sometimes perennial and slightly woody toward the base, reproducing by seeds only. The stout erect stem mostly branched above the base is green, sticky and densely hairy, 1 to 3½ feet high. The leaves are alternate mostly 2 to 6 (exceptionally to 10) inches long, including the stalk when present. They are broadly oblong or eggshaped mostly pointed at the tip but sometimes blunt. Those on the upper part of the stem are stalkless with 2 earlike lobes at the base while the ones below taper into a winged stalk.

The tubular flowers are creamy or greenish white ½ to 1 inch long and open during the day. They are somewhat hairy on the outside, short stalked and occur on long nearly leafless flowering branches at the ends of the stems. The outer green flower part (calyx) is 5-parted, ¼ to ½ inch long, hairy and sticky on the outer surface. It is persistent, enlarges at the base and nearly completely hides the mature seedpod. The smooth seedpods are many seeded, urnshaped, about ½ inch long.

The tiny kidneyshaped seeds, less than 1/25 inch long are dark or reddish brown, the surface coarsely pitted and roughened.

DISTRIBUTION—Desert tobacco is a native range weed most commonly found on dry sandy or gravelly soil. Widespread throughout most of the state in washes, flood plains, canyons and watercourses on desert, northern desert, woodland and sometimes pinyon juniper ranges, 100 to 6,000 feet elevation; flowering most of the year. Indians are reported to smoke the leaves of desert tobacco, now chiefly in ceremonial.

POISONOUS PROPERTIES — Both desert tobacco and tree tobacco contain the toxic alkaloid, nicotine, and the leaves and young stems are the most poisonous parts. Although poisonous to all kinds of livestock, cattle and horses are generally poisoned more often than sheep, under normal range conditions.
DESCRIPTION—Stout bushy annual weeds reproducing only by seeds. The coarse stems are mostly erect and branching from the base, sometimes spreading, 1 to 3 feet high or 4 to 6 feet high and 1 to 1½ inches in diameter in rich moist cotton fields where competing for light.

The alternate leaves vary widely in size and shape, on stalks ¾ to 4 inches long, the leaf blades 1¾ to 5 inches long and 1/12 to 2¾ inches broad. They may be lanceshaped, oblong, or eggshaped and mostly pointed at the tip. Usually the margins are prominently and irregularly toothed or cut, sometimes indistinctly toothed or merely wavy.

The numerous wheelshaped flowers ½ to ¾ inch across are whitish with a large yellow eye and purplish anthers. They are borne singly or a few together in any leaf axil not just in the upper ones. Each is on a threadlike stalk which lengthens and curves downward in fruit.

The outer green 5-lobed flower part (calyx) is persistent, enlarges remarkably becoming thin and papery, ¾ to 1¼ inches long, conspicuously veiny, hangs down and looks like a green Chinese lantern.

The berrylike seedpod or “cherry” ½ to ¾ inch in diameter contains many seeds and is entirely hidden by the calyx. The diskshaped seeds slightly more than 1/12 inch long are yellowish brown, the surface granular.

DISTRIBUTION — Wright groundcherry is a native weed which has become a serious pest in the irrigated valleys of southern and central Arizona. It is abundant in all types of crops from early summer to late fall, in orchards, vineyards, roadsides, ditches and pastures. Also found on open range lands on sandy and gravelly soil, along streams or moist eroded slopes 100 to about 4,000 feet elevation; flowering from June to October.
POTATO FAMILY

Solanaceae

WHITE HORSENETTLE

Solanum elaeagnifolium Cav.

A. Plant
B. Fruit
C. Seed

OTHER COMMON NAMES—bullnettle, trompillo, sand brier, silverleaf nightshade, silver horsenettle.

DESCRIPTION—An upright silvery perennial usually prickly, 1 to 3 feet high, reproducing by seeds and by deeply penetrating or creeping rootstocks. The surface of the entire plant is covered by densely matted, tiny starlike hairs which give its characteristic silvery color.

The stems, leaves, leaf and flower stalks may all bear slender yellowish spines or these may be scarce or sometimes wholly lacking. The thick leaves are alternate 1 to 4 inches long (including the stalks), ¾ to 1 inch broad, and are darker above than underneath. They are lanceshaped to narrowly oblong, the margins smooth to deeply wavy.

The showy flowers are deep violet or blue, ¾ to 1 inch across, wheelshaped and 5-lobed. They are stalked and in few flowered clusters at the ends of the stems or on short branches. The globselshaped seedpods, ⅛ to ½ inch in diameter, are dull yellow or orange yellow when mature. They are hairless and smooth, pulpy, somewhat berrylike and contain numerous seeds.

The nearly diskshaped seeds are about ⅛ inch long, yellowish brown, the surface shiny and finely granular.

DISTRIBUTION — White horsenettle is a native plant growing preferably on moist sandy soil. It is an obnoxious weed throughout the state but is especially troublesome in the irrigated valleys of southern Arizona where it is a pest in all types of crops. Abundant along roadsides, waste places, sandy washes, and bottom lands 100 to 5,500 feet elevation; flowering May to October. It is reported that the Pima Indians use the crushed berries in making cheese.
OTHER COMMON NAMES — Colorado bur, Mexican thistle, Texas thistle, Kansas thistle, beaked nightshade, sandbur, prickly nightshade.

DESCRIPTION — A low yellow, spined annual, vicious and soft hairy, reproducing only by seeds. The stems mostly branching in the upper part are erect and bushy, ½ to 2 feet long. The entire plant except the petals is covered by straight yellow spines, ⅛ to ½ inch long. The leaves are alternate, 2 to 6 inches long, (including the stalks) irregularly cut into 5 to 7 lobes and often these again 2 to 5-lobed. They are covered by short yellow starlike hairs, and the midribs, veins and leaf stalks are spiny.

The yellow flowers are 5-lobed, wheelshaped, 1 to 1½ inches across, in few flowered clusters on spiny flower stalks. The outer flower part (calyx) is covered by spines. It enlarges and forms a spiny bur enclosing and completely hiding the seedpod. The seeds are almost circular, ⅛ or slightly more in diameter, brown to reddish brown, flattened, irregularly angled and the surface finely pitted.

DISTRIBUTION — Buffalo bur, native in the Great Plains region, is probably introduced in Arizona. It grows on dry hard soil to rich moist soil of cultivated lands, as in the cotton fields of Safford (Graham county) or Avra (Pima county) valleys. Abundant throughout northern and central Arizona and increasing southward, along roadsides, yards, waste places, and overgrazed plains, sometimes covering areas many miles in extent, as south of Prescott around Mayer (Yavapai county). It is obnoxious on farms or rangelands, 1000 to 7,000 feet elevation; flowering June to September.

POISONOUS PROPERTIES — The young leaves and seedpods of both buffalo bur and white horse-nettle contain the poisonous alkaloid, solanin.
FIGWORT FAMILY
Scrophulariaceae

MULLEIN
Verbascum thapsus L.

OTHER COMMON NAMES—velvet dock, Jacob's staff, flannel leaf, flatwort, big taper, candle wick, torches.

DESCRIPTION — Mullein is an erect, stout soft, woolly biennial reproducing by seeds only. The entire plant is covered by matted layers of short hairs which are forked and starlike. The large woolly stem, usually unbranched is 2 to 6 feet high and very leafy. The leaves form a woolly rosette on the ground for the first year, from which the stem arises the second year.

The stem leaves are alternate, the basal ones 6 to 18 inches long, the upper ones gradually becoming smaller. They are crowded on the stem, nearly obleng the tips rounded or the upper leaves more pointed. The leaves are stalkless but the bases are attached to the stem and continue down it to the next leaf, thus the stem is 4-winged. The margins are smooth or slightly wavy.

The flowers are greenish yellow, stalkless, 5-lobed and \( \frac{3}{4} \) to 1 inch across. They are crowded on a long thick spike at the top of the plant, 1 to 3 feet long, and \( \frac{3}{4} \) to 1\( \frac{1}{4} \) inches thick, sometimes with 1 to several short spikes at the base. The woolly eggshaped seedpods, about \( \frac{3}{4} \) inch in diameter contain innumerable tiny seeds. These are dark brown, less than 1/25 inch long, rodshaped with 1 end pointed, the surface pitted and ridged.

DISTRIBUTION — Mullein is a naturalized weed from Europe, growing in dry disturbed soil of waste places, along roadsides, railroad embankments, old dwellings or fields. On the pinyon juniper and ponderosa pine ranges it is a conspicuous weed along sheep driveways, old bedgrounds, and corrals, and is of no value as forage. Widespread in northern and central Arizona from Apache to Mohave county and abundant in many areas, southward to the Chiricahua Mountains in Cochise county, 4,500 to 8,000 feet elevation; flowering July to October.
OTHER COMMON NAMES—ribwort, narrowleaf plantain, ribgrass, blackjacks, English plantain, buck plantain, ribbed plantain.

DESCRIPTION—A low erect perennial 1 to 1 1/2 feet high with narrow dark green leaves, from a thick fibrous root system, reproducing by seeds and sometimes by new shoots from the roots. Similar in growth habits to common plantain but the plant more or less long hairy and the leaves narrow.

The leaves are 3 to 12 inches long (including the stalk), 1/4 to 1 inch broad with smooth, wavy or barely toothed margins. They are strongly 3 to 5 ribbed, oblong or lance-shaped, tapering at the base into a slender stalk. The leaf axils are often filled with long brownish cottony hairs.

The flowers are similar to those of common plantain but occur in short thick spikes 1/4 to 2 inches long at the tip of the flower stalks, which are much longer than the leaves. (In common plantain the flower stalks are rarely longer than the leaves). The seedpods are globe-shaped, dry and papery about 1/8 inch long, contain 2 seeds, and open by the upper half falling off as a lid. The seeds are 1/16 to 1/12 or slightly more long, boat-shaped, the surface usually shiny, and greenish brown to dark brown.

DISTRIBUTION—Buckhorn plantain, also an European introduction, grows in the same type of places as common plantain and also has the same general distribution in the state. More troublesome in southern Arizona lawns than common plantain, it is one of the more annoying lawn pests there; flowering from April to October.
OTHER COMMON NAMES—broadleaf plantain, dooryard plantain, rippleseed plantain.

DESCRIPTION—Low tufted perennial from a thick fibrous root system reproducing by seeds and sometimes by new shoots from the roots. There are no true stems; those bearing the flower spikes are flower stalks. The large dark green, hairless leaves are all at the base of the plant. The leaves are broadly eggshaped or oval, 3 to 8 inches long on stalks 2 to 5 inches long and 2 to 4 inches broad, are prominently 5 to 7-ribbed, with smooth or usually wavy to toothed margins.

The numerous whitish or colorless flowers are small 4-lobed, thin, dry and persistent. They are crowded along a narrow elongated spike 3 to 12 inches long and ¼ to ½ inch thick on the upper part of the slender leafless flower stalk.

The seedpods similar to those of buckhorn plantain contain 6 to 20 reddish brown seeds. They are 1/25 to 1/16 inch long somewhat angled. The surface granular with fine radiating lines.

DISTRIBUTION—Common plantain is a naturalized weed from Europe, and primarily is a pest in lawns throughout most of Arizona. It also grows in moist soil of fields, irrigated pastures, gardens and along streams 100 to 3,000 feet elevation; flowering March to October. Its tufted growth habit, large coarse leaves, and long flowering spikes are unsightly in lawns and thus are particularly objectionable.
GOURD FAMILY

Cucurbitaceae

FINGERLEAF GOURD
Cucurbita digitata Gray

A. Fleshy root
B. Flowering branch
C. Seedling leaf
D. Fruit

OTHER COMMON NAME—fingerleaf coyote melon.

DESCRIPTION — Coarse perennial trailing or climbing vine, from a long, deep seated, fleshy tuberlike taproot several inches in diameter, reproducing by seeds and by stems rooting at the joints. The tough stems are angled 3 to 10 feet (or to 40 feet in moist cotton fields) long, 1 or few from the root, these branching immediately and radiating from the root.

The leaves are widely spaced on the stems, 3 inches to more than a foot apart. They are divided very nearly to the base into 5 lance-shaped narrow lobes 1½ to 10 inches long ½ to more than an inch broad, the margins smooth, toothed or sometimes with 1 or more pairs of lobes. They are on stalks 1 to 5 inches long. The upper surface is dark green with conspicuous broad bands of short stiff white hairs along the veins, the lower surface uniformly rough hairy, varying from very dense and the surface gray to very sparse and the surface green.

The large yellow flowers are of 2 kinds male and female although they have a similar appearance and occur in the same leaf axil. They are 2 to 4 inches long. The seedpod is a smooth globeshaped gourd, 2 to 3 or more inches in diameter, green with pale green longitudinal markings and at maturity yellowish green with pale yellow stripes. The seeds embedded in the pulp are shaped like pumpkin seeds, about ¼ inch long and tan colored.

DISTRIBUTION — Fingerleaf gourd is a native weed usually growing on dry gravelly or sandy soil of roadsides, waste places, plains and mesas but spreading into adjacent cotton or other cultivated fields as in Avra Valley (Pima county), and becoming a pest on irrigated lands. Often a nuisance on ranches. Found throughout southern and central Arizona 100 to about 5,000 feet or less; flowering June to October.

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OTHER COMMON NAME — Mexican devilweed

DESCRIPTION — Grayish, much branched perennial, nearly leafless 2 to 9 feet high, reproducing by seeds and by widespread creeping rootstocks. The intricately branched grayish stems are hairless, longitudinally ribbed, woody below, with few to many very stout, stiff, sharp, greenish spines, \( \frac{1}{2} \) to 1 inch long borne in or above the axils of the upper leaves.

The upper leaves are scarce, scalelike but green and soon fall off. The lower leaves also scarce are very slender \( \frac{3}{4} \) to 2\( \frac{1}{2} \) inches long. The flower heads are \( \frac{3}{4} \) to \( \frac{3}{2} \) inch high and \( \frac{3}{4} \) to \( \frac{3}{2} \) inch across, including the many narrow white "petals" (ray flowers), the center of the head is yellow or brownish.

The flower heads are many to numerous, stalked, and borne at the top of the plant on branching flowering stems, or sometimes they are solitary at the end of a branchlet. The reddish brown seeds (achenes), 1/16 to 1/12 inch long are narrowly oblong, hairless, longitudinally ribbed, with a tuft of fine hairs at 1 end.

DISTRIBUTION — Spiny aster is a native plant, commonly forming hedgelike thickets along the banks of irrigation ditches. In many agricultural areas it spreads into the cultivated fields and becomes a serious pest in many cultivated crops, especially in soybean, cotton, alfalfa or small grain fields, as in the Yuma Valley. It also grows in moist saline soil along river bottoms, pastures, and low places. Found throughout the state in the deserts, 100 to about 4,500 feet elevation; flowering April to October, but principally in the summer and fall.
SUNFLOWER FAMILY

Compositae

SEEPWILLOW

*Baccharis glutinosa* Pers.

A. Flowering branch
B. Fruiting branch
C. Fruit

OTHER COMMON NAMES—
water wally, Gila willow, water willow, groundsel tree, batamote, watermotie.

DESCRIPTION—Straggling shrubs with willowlike leaves and several clustered stems 3 to 10 (or 13) feet high, reproducing by seeds only. The stems are woody below, ½ to 1 inch diameter at base with green, prominently grooved branches. The bark on the old stems is dark gray and furrowed. The numerous leaves are alternate bright green, leathery, lustrous from sticky resins and have a rather pleasant odor, narrowly lance-shaped, 1½ to 6 inches long, ¼ to ¾ inch broad, and the margins smooth or usually with small but definite teeth.

The small unattractive greenish yellow flowering heads about 1/5 inch diameter, occur in dense clusters at the tips of the main branches only and are not scattered in the leaf axils. Male and female heads grow on separate plants. These plants are obviously distinguishable at the seedling stage. The narrowly oblong seeds (achenes) 1/25 to 1/16 inch long, are straw colored to greenish brown, with 5 white longitudinal ribs, and at 1 end bearing a thin tuft of fine silky whitish hairs, 1/5 inch long.

DISTRIBUTION—A native bush confined largely to natural watercourses, semipermanent irrigation canals or ditches, and streambanks. Very common along the Colorado River drainage from Apache to Mohave county and throughout southern Arizona on the desert and desert grassland ranges from 100 to 5,700 feet elevation; flowers from March to December.

Seepwillow is unpalatable and worthless as forage. It often forms dense thickets along streambeds, and in water-conscious Arizona is considered to make excessive use of precious water. It also may clog stream channels and cause flash floods to back up and inundate adjacent lands.

Because of its rapid growth and deep fibrous roots it has been used extensively in erosion control plantings along watercourses and is propagated from cuttings. It is interesting to note that seepwillow like tamarix is now considered an objectionable weed due to characteristics which were considered virtues at one time.
OTHER COMMON NAME —
Turkestan thistle

DESCRIPTION—Erect very leafy perennial 1 to 3 feet high reproducing by seeds and spreading by new shoots from slender creeping and upright rootstocks. The principal stem is much branched above, often whitish with soft tangled hairs which drop off in tufts leaving the stem hairless in spots.

The oblong leaves at the base of the stem, 1½ to 5 inches long, ½ to 1 inch broad are short stalked, the margins cut into irregular lobes and frequently with 1 larger lobe at the tip. The middle and uppermost leaves are ½ to 2 inches long, 1/12 to ½ inch broad narrowly oblance-shaped, stalkless and clasping the stem at the base, the margins always smooth in the uppermost leaves but sometimes shallowly few lobed or toothed in the middle ones.

The cupshaped flower heads enclosed by pearly and paperish bracts are ½ to 1½ inch across, ½ to 1 inch long and composed of rosy lilac to bluish flowers each of which is deeply 5-lobed. The flower heads are borne solitary at the end of each branch or branchlet, which are leafy up to the heads. Each flower head produces about 16 seeds (achenes). The ivory colored seeds are flattened, ½ to ¾ inch long.

DISTRIBUTION—Russian knapweed, a pernicious native of eastern Europe and Asia, grows in disturbed soil, forming colonies in cultivated fields, orchards, ditches, roadsides and waste places Scattered throughout central and southern Arizona and abundant in local areas, 100 to about 5,500 feet elevation; flowering June to September.

Russian knapweed should be considered a very dangerous and serious weed and its spread viewed with alarm. Because of its efficient root system, this weed, once established, is very hard to eradicate.
SUNFLOWER FAMILY

Compositae

HORSEWEED

_Erigeron canadensis_ L.

A. Basal portion of plant
B. Flowering branch
C. Leaf
D. Seed

OTHER COMMON NAMES—marestail, Canada fleabane, colts-tail, cowstail, butterweed, pride-weed, fleabane.

DESCRIPTION—An erect annual or biennial, the stems slender to very coarse, usually branching only in the flower part, ¼ to 4 or more feet high, reproducing by seeds only. The plants are thinly rough hairy to practically hairless. The dark green leaves are alternate 1 to 4 inches long and ½ to ½ inch broad, often so crowded as to nearly hide the stem. They are stalkless or the lowermost short stalked, lance or strapshaped, the margins smooth or more often wavy to few toothed.

The greenish whitish flower heads are small, innumerable in a long many branched flowering mass (panicle) at the top of the plant, which is ½ to 2 feet long. Individually they are inconspicuous, about ⅛ inch high and ⅛ inch across with many whitish "petals" (ray flowers) too small to be seen without the aid of a lens. The narrow seeds (achenes) are tan colored flattened, 1/25 to 1/16 inch long with a few scattered hairs on the surface and a thin tuft of about a dozen fine colorless hairs at the blunt end.

DISTRIBUTION—Horseweed is introduced from the eastern United States preferring rich moist soil of cultivated lands or sandy alluvial soil but growing in any type of disturbed soil. It is widespread throughout the entire state but is a pest in the agricultural valleys in all summer and fall crops. Also common along roadsides, pastures, yards, gardens, waste places, streams and hillsides, 100 to 7,500 feet elevation; flowering July to October.

The leaves and flowers of horseweed are reported to contain a terpene which may cause dermatitis and throat irritation in susceptible individuals and in the nostrils of horses. At one time an oil was distilled from this plant which was used medicinally in the treatment of dysentery and diarrhea.
SUNFLOWER FAMILY

Compositae

BURSAGE RAGWEED

Franseria confertiflora (DC.) Rydb. (F. tenuifolia Harv. & Gray)

A. Flowering branch
B. Flowers
C. Fruit

OTHER COMMON NAMES — slimleaf bursage, franseria povertyweed, franseria ragweed.

DESCRIPTION — A very leafy, somewhat bushy perennial, 1 to 3 feet high, reproducing by seed and slender creeping rootstocks. The leaves, often so hairy they appear gray, are divided into narrow lobes that may be further divided into still smaller lobes. They are all alternate and about 2 to 5 inches long.

The many, narrow flowering spikes, arising at the tips of the branches, are 2 to 5 inches long and bear many small heads of tiny male flowers enclosed in a drooping green cup. The female heads, clustered in the leaf axils below the male spikes are seldom seen until they mature into spiny little burs. They are topshaped, beak tipped, granular, 1/12 to ½ inch long, and armed with 10 to 20 curved spines, about 1/25 inch long which end in a definite hook.

DISTRIBUTION — Bursage ragweed is native, growing in dry or moist, rocky, sterile or fertile soil. Abundant along city streets, highways, waste places and edges of cultivated fields, also on barren mesas and slopes in southern and central Arizona; less troublesome northward except in local areas where colonies have become established (i.e. around Flagstaff); 1,000 to 7,000 feet elevation. Flowering from April to November its pollen is not a serious hayfever hazard.

Annual Burweed

Franseria acanthicarpa (Hook.) Coville

A bushy annual, distinguished from bursage ragweed by larger burs (½ to ½ inch long) with longer spines (1/12 to 3/16 inch long), which are straight, not hooked at the tip. Very common in sandy soil in northern Arizona, infrequent southward.

Bur Ragweed

Franseria discolor Nutt.

OTHER COMMON NAMES — silverleaf, povertyweed, white weed, whiteleaf franseria.

A perennial similar in growth habits to bursage ragweed but easily distinguished by its leaves, which are silvery white beneath and green above. In yards and cultivated ground at Flagstaff, local in many other areas in northern Arizona at 5,000 to 7,500 feet elevation.
SUNFLOWER FAMILY

Compositae

SNAKEWEED

Gutierrezia sacirothrae (Pursh) Britt. & Rusby

Flowering branch

OTHER COMMON NAMES—turpentine weed, rosin weed, broomweed, rockweed, matchweed, brown weed, yellow weed, yerba de vibora.

DESCRIPTION — Low compact perennial half shrub ½ to 1½ (or 2) feet high from a woody base which becomes a branched crown in old plants, reproducing by seeds only. The innumerable stems are very slender and much branched, woody only at the base. The slender alternate leaves are very numerous on the stems, mostly 3⁄4 to 1½ inches long and 1/25 to 1/12 inch broad, with smooth margins.

The yellow flowering heads are very small covered by sticky resin, distinctly topshaped broader above tapering to a narrow base, ¾ to ¾ inch long about 2/5 inch across, and have 3 to 8 deep yellow very short “petals” (ray flowers) which roll up in age. The flowering heads are stalkless or on very short stalks, in small dense clusters at the tips of the many small branchlets at the top of the plant.

Each flower head produces 6 to 18 seeds. The seeds (achenes) are narrowly oblong about 1/25 inch long, hairy, and at the larger end bear about 8 to 12 narrow white scales about 1/25 inch long.

DISTRIBUTION—A native and serious range pest growing well on a wide range of soil sites from gravelly shallow immature soils to deep, sandy well developed loams and clayey soils. Common on rangelands from Apache to Mohave counties south to Cochise and Pima counties at elevations from 2,800 to 7,000 feet; flowering from July to October.

It is an aggressive and noxious weed covering millions of acres in northern Arizona. It increases markedly on open grassland and woodland ranges with continued heavy grazing use by livestock and improper range management. Increase in abundance is generally accompanied by loss in grazing capacity.

POISONOUS PROPERTIES — Usually unpalatable, but when green it is often relished by sheep. Livestock may be forced to eat snakeweed under conditions of forage shortage. Extensive browsing of the plant may cause poisoning to sheep, goats and cattle but probably does not cause abortion in cattle. In Wyoming it sometimes grows on seleniferous soils.
SUNFLOWER FAMILY

Compositae

SNEEZEWEED

Helenium hoopesii Gray

A. Basal portion of plant
B. Basal leaf
C. Flower heads
D. Flower with fruit

OTHER COMMON NAMES—western sneezeweed, yellowweed, sunflower, orange sneezeweed, owlsclaws.

DESCRIPTION — Sneezeweed is a coarse perennial with large leaves from a woody taproot, reproducing only by seeds. There are 1 to several stems which are branched above, 1½ to 3 feet high. The young plants are hairy but nearly hairless in age. The alternate leaves are thick and stalkless with smooth margins, the ones at the base of the plant are larger 5 to 15 inches long round ed at the tip with tapering bases while those on the stem are 3 to 10 inches long and usually pointed at the tip.

The sunflowerlike heads are 1½ to 3 inches across including the orange yellow “petals” (rays). The center of the head is orange brown. There are about 3 to 6 heads at the top of each stem. Each head produces many seeds. The seeds (achenes) are topshaped, about ⅛ inch long, densely hairy, ribbed and at the larger end bearing 5 to 8 thin colorless pointed scales.

DISTRIBUTION — This stout, perennial native range weed occurs in the higher mountain areas of eastern Arizona from Coconino to Pima counties at elevations ranging from 7,500 to 11,000 feet; flowering from June to September. It is most abundant on moist well drained meadows and deep rich soils of coniferous forests.

POISONOUS PROPERTIES — Sneezeweed is poisonous to sheep, cattle and horses. Most losses occur in sheep. It contains the poisonous glucoside, dugalin. Although all parts of the plant are poisonous the fresh plants are more poisonous than the dried ones.

The poison is cumulative and the animal must feed on the plant about 20 days before it is sickened. It causes what is commonly known as the “spewing sickness.” This weed is not abundant enough in Arizona to be serious.
SUNFLOWER FAMILY

Compositae

SUNFLOWER
Helianthus annuus L.*

OTHER COMMON NAMES — wild sunflower, common sunflower, annual sunflower.

DESCRIPTION — Sunflower is a tall, robust, branched annual, 3 to 7 feet or more high, reproducing only by seed. The rough-hairy leaves, are eggshaped or heart-shaped, pointed at the tip, the edges usually toothed. They are mostly alternate, 2 to 13 inches or more long, ½ to 6 inches broad, the upper with short stalks, and the middle and lower with stalks to 8 inches long.

The large flower heads, 2 to 5 inches broad, have reddish brown centers and bright yellow petals (rays). The wedgeshaped seed (achenes), about 3/16 inch long, are short-hairy, grayish brown, or sometimes lighter streaked or mottled.

DISTRIBUTION — Sunflower grows in moist soils, principally along roadsides, lowlands, cultivated fields and on barren places in the pinyon-juniper ranges. Although it is abundant almost throughout the state it is not a particularly noxious weed, and is very ornamental, 100 to 7,500 feet elevation; flowering March to October. It was probably introduced from the Great Plains area.

Prairie Sunflower
Helianthus petiolaris Nutt.

OTHER COMMON NAMES — sand sunflower, plains sunflower.

Very similar in appearance to the sunflower but generally more slender and shorter, mostly ½ to 3 feet high. The leaves are smaller, narrower, more lanceshaped, and the edges usually are not toothed. The flowering heads are smaller, 1 to 2 inches broad with stiff whitish hairs visible in the dark centers. With the same general distribution as sunflower but not as common.
SUNFLOWER FAMILY

Compositae

BLUEWEED

Helianthus ciliaris DC.

A. Flowering branch
B. Fruit

OTHER COMMON NAMES—blue sunflower, yerba parda.

DESCRIPTION — Blueweed is a low, bluish or grayish green perennial, 1 to 2 feet high, reproducing by seed but principally by the wide-spreading underground system of creeping and upright roots and rootstocks. The leaves, which give the plant its color, are stemless and may be alternate or opposite. They are narrow to broadly lanceshaped, 1 to 4 inches long, and vary greatly in width, from 1/12 to 1/4 inch. The margins are often very wavy and bear short stiff hairs. Similar hairs may also occur along the veins on the lower surface.

The flower heads, 1 to 1½ inches broad, have yellow petals (rays) and the centers are dark purplish brown. The narrow, wedgeshaped seeds (achenes) are grayish brown, 4-angled, and about 1/8 inch long.

DISTRIBUTION — Blueweed is one of the few noxious weeds in the state that is native. It grows in dense colonies in heavy saline or alkaline soil, in low drainage areas, dry lakes, and roadsides from whence it spreads onto cultivated lands. It is found nearly throughout the state, 100 to 7,000 feet elevation, and flowers from May to October. It is especially troublesome in southern Apache and Navajo counties in the White Mountains area. Blueweed is a potential pest in any cultivated field it invades. Cultivation may aid its spread. The underground stems (rootstocks) are cut into pieces and distributed through the soil. These pieces are capable of starting new plants. Its growth is so vigorous that many crops cannot compete favorably and are crowded out. A circular patch of blueweed, 500 feet in diameter, was observed in a bean field near Vernon (Apache county).
SUNFLOWER FAMILY

Compositae

TELEGRAPH PLANT

Heterotheca subaxillaris (Lam.) Britt. & Rusby

OTHER COMMON NAMES — camphorweed, heterotheca.

DESCRIPTION — Tall coarse hairy annual or sometimes biennial with a strong odor, from a taproot, reproducing by seeds only. There is 1 principal stem mostly branching only at the top and spreading, resembling a telegraph pole, 2 to 6 feet high. It is more or less covered by long, spreading hairs with the upper branchlets and flower stalks bearing glandtipped hairs and somewhat sticky.

The leaves are alternate with the margins toothed. The lower and basal leaves are large, oval or oblong; they are on a slender stalk and usually there is a pair of leaflike lobes on either side of the stalk base. The upper leaves are much smaller and stalkless, their bases heartshaped and clasping the stem.

The flower heads are yellow about $\frac{1}{4}$ to $\frac{3}{8}$ inch high and $\frac{1}{4}$ to $\frac{3}{8}$ inch across, including the 20 or more deep yellow “petals” (ray flowers). The seeds (achenes) are of 2 kinds, both of which are maroon colored and $\frac{1}{12}$ to $\frac{1}{6}$ inch long. Some are 3-angled, entirely hairless and without the tuft of hairs. The others are covered by whitish hairs, not 3-angled and have a tuft of brownish hairs from the larger end.

DISTRIBUTION — Telegraph plant, a native of tropical America, grows in moist or dry sandy soil along ditchbanks in cultivated fields, or edges, roadsides, and low places where water collects, also in sandy washes. Although it grows in dry soil it attains its best growth in moist soil as in and around the irrigated lands. Common throughout central and southern Arizona 100 to 5,500 feet elevation; flowering March to November but largely in late summer.
SUNFLOWER FAMILY

Compositae

BITTERWEED
*Hymenoxys odorata* DC.

A. Plant
B. Fruit

OTHER COMMON NAME — bitter rubberweed.

DESCRIPTION — Hardy bushy annual with several or numerous stems greatly branched and often widely spreading, ½ to 2 feet high, reproducing by seeds only. The plant, like pingue is bitter tasting and has a pungent odor.

The leaves are fleshy and divided into 3 to 13 threadlike divisions ¼ inch or less broad, the surface gland dotted. A quickly withering rosette of leaves, 1 to 4 inches long, is formed at the base of the plant. Those on the stem are alternate and ¼ to ¾ inches long.

The numerous yellow flower heads are ½ to 1 inch across including the golden yellow, 8 to 13, "petals" (ray flowers). The heads are borne singly on stalks 1 to 6 inches long at the tips of all the branches and a single plant may have hundreds of heads. Each flowering head produces 50 or more seeds (achenes). These are somewhat wedgeshaped ¼ to ⅛ inch long, indistinctly 4-angled and covered with silvery silky hairs.

DISTRIBUTION — Bitterweed is a native annual weed growing in moist heavy clay, alkali, adobe, sandy, or alluvial soils. It is most common in drainage areas, as flood plains, lake beds, roadsides, and especially abundant along the bottom lands of the Gila river (Yuma county) and Little Colorado river (Navajo and Coconino counties). Found in southern and central Arizona 350 to 6,000 feet elevation; flowering January to June. The plant increases in abundance whenever the grass cover has been thinned by confined too heavy grazing use or by drought.

POISONOUS PROPERTIES — Bitterweed is ordinarily eaten only when good forage is scant. Since it greens up early in the spring before other vegetation, animals hungry for green feed may be attracted to it. Although reported to be poisonous to cattle it is most troublesome to sheep.
SUNFLOWER FAMILY

Compositae

PINGUE

_Hymenoxys richardsoni_ (Hook.) Cockl. var. _floribunda_ (Gray) Parker

A. Plant
B. Flower with fruit

OTHER COMMON NAMES—Colorado rubberweed, rubberweed, turkey track.

DESCRIPTION—Low tufted, upright perennial from a branched woody crown, reproducing by seeds only. The plants are bitter tasting with a strong pungent odor. The several stems are greatly branched above and 6 to 18 inches high.

The fleshy leaves, the surface gland dotted are rather rigid. They form basal tufts around the stems, 1½ to 6 inches long, with a dense mass of cottony hairs between the axils. The leaves on the stem are alternate, ¼ to 2 inches long. All are very narrow and may be un-divided or mostly are divided into 3 to 7 long narrow lobes about 1/25 to 1/12 inch broad.

The yellow sunflowerlike heads are ½ to 1¼ inch across, including the 7 to 10 bright yellow “petals” (rays). They occur in large numbers at the tips of all the branches giving the plant a flattopped appearance. Each head produces 25 or more seeds (achenes) similar to those of bitterweed but about ½ inch long.

DISTRIBUTION—A native perennial weed, thriving on all soils from dry to moist, poor to fertile and sandy to heavy clays. Pingue reaches its greatest development in open grasslands, occupying all slopes and exposures with nearly equal vigor and density. It grows well, although stands may be sparse under oak, juniper and ponderosa pine. A noxious and abundant weed on northeastern Arizona ranges, from Apache to Coconino and Yavapai counties, 5,000 to 9,000 feet elevation; flowering from June to September.

Pingue increases in abundance whenever the grass cover is thinned by continued close grazing. The plant contains a rather high percentage of latex which during both World War I and II was extracted and manufactured into rubber. High costs of harvesting and latex extraction and slow growth of the plant prevent commercial development.

POISONOUS PROPERTIES — Pingue is poisonous to sheep. The plant is not eaten by cattle. Death losses in sheep may occur at any time of the year but the greatest danger is in the spring or late fall when palatable forage is apt to be scarce and sheep are forced to eat pingue.
SUNFLOWER FAMILY

Compositae

POVERTY WEED

*Iva axillaris* Pursh

**OTHER COMMON NAMES**—small flowered marsh elder, death weed, devil’s weed, poverty sumpweed.

**DESCRIPTION**—Poverty weed is a rank smelling, very leafy, bushy perennial, usually growing in colonies, and reproducing by creeping roots, erect rootstocks, and seed. The slender stems, branching from the base are ½ to 2 feet high. The small, thick, stalkless leaves, opposite below and alternate above, are oblong, ½ to 1½ inches long, and occur to the very tip of the branches.

Small drooping flower heads enclosed by a green cup, and composed of tiny flowers, the outer 5 female and the inner 10 to 25 male, occur singly at the leaf bases on the upper half of the stems. The brown, topshaped, granular seeds (fruit), 1/12 to ½ inch long are beaked at first.

**DISTRIBUTION**—Poverty weed is a native, preferring alkaline soil. It has become a pest in grain fields, other crops, flats, and waste places in many areas in northern Arizona (i.e. Woodruff, Show Low, Tuba, Punkin Center, Fredonia) 4,000 to 6,500 feet elevation; flowering May to August.

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**Marsh Elder**

*Iva xanthifolia* Nutt.

**OTHER COMMON NAMES**—false ragweed, false sunflower, burweed marsh elder, trail weed, highwater shrub, redriver weed.

A tall, scarcely branched annual, 2 to 6 feet or more high, reproducing by seeds. The long-stalked, large leaves, mostly opposite, are very similar to those of cocklebur. The flowers are like those of poverty weed but here the flower heads are stalkless and are crowded on long, branching spikes at the top of the stems and the upper leaf bases.

The flowering part of the plant may be 1 to 2 feet or more long. The seeds are blacker than those of poverty weed and not granular.

Marsh elder grows in moist soil along streams, roadsides, and waste places in northern Arizona and is also a frequent garden weed in the Phoenix area, 1,000 to 7,500 feet elevation; flowering July to October. The pollen may cause serious hay fever and the leaves produce a skin rash in some people. Fortunately it isn’t very common in Arizona.

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SUNFLOWER FAMILY
Compositae

PRICKLY LETTUCE
*Lactuca serriola* L.

**OTHER COMMON NAMES**—English thistle, milk thistle, horse thistle, wild lettuce, common wild lettuce, compass plant, wild opium.

**DESCRIPTION**—Stiff erect annual, winter annual or biennial with milky juice, from a large taproot, reproducing only by seeds. There is 1 stiff, principal stem, often hollow, branching in the flowering part of sometimes with a few short branches from the base, smooth above but usually with sharp prickles on the lower part, 2 to 6 feet high.

The leaves are alternate, bluish green, stalkless, tightly clasping the stem with 2 angled or earlike lobes. The lower leaves are 2 to 8 inches long and of 2 types. The margins may be undivided or they may be cut into deep irregular lobes, both types often with prickles along the margins, the large white midvein and the other veins on the lower leaf surface. The upper stem leaves are all smaller and similar to the first type of lower leaves.

There are many yellowish flower heads ¼ to ½ inch broad, composed entirely of petallike flowers. The flower heads are on short stalks and are borne at the top of the plant on many branched flowering stems. Each flower head produces 6 to 30 seeds.

The seeds (achenes) are egg-shaped, flattened, about ¼ inch long or less, light gray, with 6 parallel ridges on each side, and a very slender beak arising from the broad end which bears a tuft of fine white hairs. The hairs drop off quickly.

**DISTRIBUTION**—Prickly lettuce is an introduced European weed growing in any type of disturbed soil. It is a serious pest in irrigated crops especially in those which are not weeded regularly as in grain or alfalfa fields, orchards and vineyards. Also common along roadsides, yards and gardens. Widespread throughout the state, from 100 to about 8,000 feet elevation; flowering May to October.
OTHER COMMON NAMES — prickly sowthistle, spiny sowthistle, spinyleaf sowthistle.

DESCRIPTION — A tall erect fleshy annual with milky juice from a stout taproot, reproducing only by seeds. The large hollow stem is unbranched or few branched 1 to 3 or more feet high.

The alternate leaves are large 3 to 12 inches long. The lower leaves are usually divided into large crinkly lobes with the lobe at the end often much larger and triangular. The margins irregularly toothed and sharp pointed. These leaves have stalks. The margins of the upper leaves are irregularly cut, jagged and long toothed but usually not divided into definite lobes. These leaves are not stalked but clasp the stem with a pair of large rounded earlike lobes.

The upper part of the stem and the flower stalks usually have a few to many stalked glands, but sometimes these are entirely lacking. The flower heads are numerous, 1⁄4 to 1 1⁄4 inches across and composed wholly of pale yellow petallike flowers or rays. The seeds (achenes) are reddish brown, 1⁄12 to 1⁄6 inch long, not beaked, flattened, with 3 (or 5) prominent longitudinal ribs on each side and not cross roughened. The margins are narrowly winged. The tuft of hairs drops off quickly.

DISTRIBUTION — Sowthistle is a naturalized European weed, widespread throughout the state, found in about the same type of places and with the same flowering period as prickly lettuce.

Common Sowthistle

OTHER COMMON NAMES — annual sowthistle, hares lettuce, colewort.

Very similar to sowthistle and often not easily distinguishable without a lens to examine the seeds. It differs principally in that the seed is not wingmargined nor obviously flattened, the longitudinal ribs are not definite and prominent, and the surface is roughened crosswise. The 2 earlike lobes at the base of the upper stem leaves are sharp pointed rather than rounded. Also, there are no stalked glands on the upper stems and flower stalks.
OTHER COMMON NAMES—lions tooth, blowball, cankerwort.

DESCRIPTION — A low perennial from a long stout branched taproot, reproducing by seeds and by new shoots from the roots. There are no true stems and the leaves are clustered at the base of the plant. They form a rosette on the ground or are ascending to upright. The leaves vary greatly in size and lobing. They are from 2 to 12 inches long and usually divided into few or several indistinct pairs of lobes, which are pointed or blunt at the tips. Often the lobe at the tip of the leaf is much larger and triangular in shape.

The flower heads are 1 to 2 inches across and composed entirely of yellow petallike flowers or rays. They are solitary at the end of long naked hollow flower stalks, which are 3 to 12 or more inches long.

The seeds (achenes) are greenish or light brown about ⅛ inch long, 4 or 5 ribbed and minutely toothed along the upper margins, ending in a long slender beak 2 or 3 times as long as the seed and attached to a tuft of fine silky whitish hairs, which fall off quickly.

DISTRIBUTION — Dandelion is an European introduction. It grows in moist places and is a much hated pest in lawns throughout the state. It also grows in the cultivated fields and croplands, along roadsides, in yards, gardens, pastures, and on overgrazed or eroded areas in open mountain meadows of the high mountain ranges, or in moist soil along streams in lower ranges, 100 to 9,000 feet elevation; flowering in some places almost the year around. It is good forage on the ranges and is especially relished by sheep.
DESCRIPTION—Annual golden-eye is a bushy, sparingly leafy annual, 1 to 3½ feet high, reproducing only by seed. The slender stems are reddish brown and many branched with the leaves spaced far apart. The narrow leaves are mostly opposite, 1 to 3 inches long and only 1/16 to ⅛ inch broad.

There are large numbers of yellow flowering heads, about 1 inch broad, including the bright yellow petals (rays). They are sunflower-like and are borne at the tips of all the branches. The slender wedge-shaped seeds (achenes) are blackish, 4-angled, and about 1/16 inch long.

DISTRIBUTION—A native weed, annual golden-eye is found on open, disturbed soil on ridges, plains, and bottomlands, where it replaces valuable forage plants on run-down ranges. Abundant in pinyon-juniper woodland and desert grasslands throughout the state, except in the western part, 2,500 to 8,000 feet elevation. It is especially prolific in Yavapai, eastern Mohave, and Cochise counties; flowering from May to October but mostly in September and October.

POISONOUS PROPERTIES — This plant is suspected to be the cause of the bulbar paralysis among sheep and cattle which occurs regularly in Cochise county in the fall. Hydrocyanic poisoning is indicated. As in Johnson grass, the necessary enzyme is present. But unlike that plant, the poisonous glucoside is not. The animal must eat another plant which does contain that compound before the hydrocyanic acid is formed.
SUNFLOWER FAMILY
Compositae

COCKLEBUR
Xanthium saccharatum Wall. (X. canadense Mill., X. pennsylvanicum Wallr.)

OTHER COMMON NAMES—clotbur, button bur, ditch bur, sheep bur, hedgehog burweed, sea burdock.

DESCRIPTION—Cocklebur is a coarse, bushy annual with stout, usually red-spotted stems, 2 to 3 feet high, and reproducing by seed. The large, rough glandular, green leaves are longstalked, triangular, somewhat lobed, about 2 to 14 inches long and 1 to 8 inches broad. The short flowering branches arise from the leaf axils along the main stems.

The inconspicuous male flowers are grouped into several to many round clusters at the top with the conspicuous brown burs at the base. The football shaped burs, ½ to 1 inch or more long, enclose 2 female flowers and are covered by about 400 stiff, glandular-hairy spines, ½ to ¾ inch long ending in a hook. The male flowers drop off quickly but the burs persist, with the 2 blackish seeds (about ¼ inch long) inside remaining fertile for many years.

DISTRIBUTION—Cocklebur grows in moist, flooded soil of roadsides, cultivated fields, pastures, and flats throughout the state, particularly troublesome in wet years on the sheep ranges of northern Arizona, 100 to 6,000 feet elevation; flowering June to October. The vicious burs form tangled clots in the manes, tails, or wool of animals, often causing a lowering in the value of the wool.

POISONOUS PROPERTIES —The seeds and the seedling plants of cockleburs are poisonous to hogs, particularly. But sheep, cattle, horses, and chickens have also been poisoned by eating them. They contain the poisonous compound, xanthostrumarin, which decreases as the plant grows.

Spiny Cocklebur
Xanthium spinosum L.

Only 2 species of cocklebur occur in Arizona and they do not resemble one another. Spiny cocklebur has 1 or more stout, yellow, 3-forked spines, ½ to 1 inch or more long, at the base of each leaf. The narrow long pointed leaves 1 to 5 inches long, mostly 2 to 5-lobed, are silvery white beneath and dark green above with the midvein white. The short-spined burs are only ½ to ¾ inch long.

Spiny cocklebur has the same general distribution and grows in similar situations as cocklebur but is not common. An area where it is troublesome is the Chino, Skull, and Peeples valleys in Yavapai county.
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Drawings in this circular are by Lucratia Breazeale Hamilton.

GLOSSARY

Achene—a one-seeded fruit in which the seed and fruit are not closely adhering
Awn—a bristle-like appendage.
Axil—upper angle between the leaf and the stem.
Calyx—the outer set of floral leaves, composed of the sepals.
Corolla—the set of floral leaves, usually showy, composed of the petals.
Embryo—young plant, usually in the seed.
Flower heads—a compact type of inflorescence, common in the composite.
Glomer—secretory tissue.
Glands—small chaff-like bracts, usually associated with grass flowers.
Gra—fruit of the grass family.
Inflorescence—a cluster of flowers.
Panicle—a loose, irregularly compound inflorescence with stalked individual flowers.
Petal—one of the set of floral leaves, usually showy.
Ray flowers—the flowers on an inflorescence (head) with strap-shaped ca-
oroll.
Rosette—parts radiating from a central point.
Sepal—one of the outer set of floral leaves, usually leaf-like.
Sheath—basal portion of the leaf which usually clasps the stem.
Spike—an unbranched inflorescence in which the flowers are not stalked.
Spikelet—the floral unit of the grass inflorescence.
Stamen—male portion of the flower.
Succulent—fleshy, soft, thickened in texture.
Tuber—swollen underground stem.

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