Progressive Agriculture IN ARIZONA

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Costs of Pumping Water

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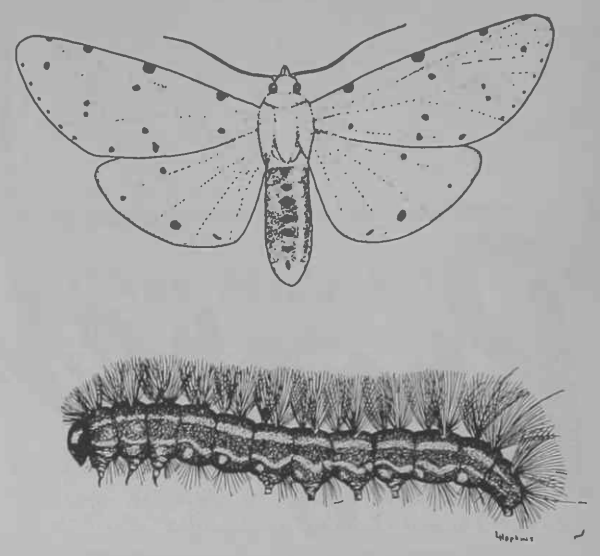
Vol. IV No. 3 Oct., Nov., Dec., 1952

Woolly Worms Friend or Foe?

They Can Do Either Harm or Good Depending on What Crop They Eat



▲ This is a drawing of the Salt Marsh caterpillar, showing the "woolly worm" and the adult moth. Both are about normal size.

By L. A. Carruth
And G. D. Butler, Jr.
Department of Entomology

Salt marsh caterpillars, or "Woolly Worms," are among the most common travelers along and across the highways in the cotton-growing areas of Arizona during the fall months.

These insects particularly favor cotton foliage and, when abundant, are very effective defoliators. Whether they are to be considered friend or foes depends upon how early in the season they appear and whether one is a cotton grower or a vegetable grower.

Salt marsh caterpillars are usually most abundant during the latter part of the growing season. Infestations on cotton foliage during September and later cause relatively little damage in most parts of Arizona. At this time a free defoliation by insects is an aid to harvesting.

May Become Pest

If cotton foliage is destroyed to any extent by salt marsh caterpillars during August, or during early September in areas having an exceptionally long growing season, such as Yuma County, this insect may be considered as a cotton pest.

The caterpillars are of particular importance after they have exhausted the available supply of preferred cotton foliage and have begun to migrate across roads and ditches to fields of other crop plants, particularly fall lettuce. It is at this time that the average motorist is aware of their activity and the lettuce grower takes steps to exclude or destroy these uninvited visitors.

In Most of U. S.

The salt marsh caterpillar, which bears the technical name, *Estigmene acraea*, occurs as a minor pest in most parts of the United States. The common name was given when the caterpillars were observed damaging hay grasses in the salt marshes near Boston, Massachusetts, in about the year 1820. The insect has been recorded as feeding on over 200 different kinds of crop and weed host plants.

The eggs are laid in large masses on the lower leaf surfaces of cotton and other host plants. The caterpillars feed at first in colonies and at this stage consume only the lower surfaces of the leaves. The older larvae feed individually and consume entire leaves. The larvae are black or yellowish, approximately two inches long when fully grown and densely covered with long hairs, which explains the popular name "woolly worms."

The attractive moths are predominantly white with a scattering of black dots and with much of the abdomen orange-brown. This color is also found on the hind wings and the lower surfaces of the front wings of the male moths. Several generations are present each year but the insect is most noticeable in the fall months.

Control with Dust

When the caterpillars are sufficiently injurious on cotton to require control measures the official recommendation of Dr. J. N. Roney, Extension Entomologist, is a dust containing 5 percent DDT, 15 percent toxaphene and a high percentage of 325-mesh conditioned sulfur applied at the rate of 20 to 25 pounds per acre per application. An emulsion spray containing 1 pound of technical DDT and 3 pounds of technical toxaphene per acre may also be used.

The control of salt marsh caterpillars which have migrated from cotton to other crops, is a more difficult problem, although good protection has been given by the use of carefully maintained aluminum foil barriers around the edges of fields of lettuce and other susceptible crops.

Progressive Agriculture IN ARIZONA

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Arizona farmers, ranchmen, and homemakers may have their names placed on the mailing list to receive Progressive Agriculture at no cost by sending a request to the College of Agriculture, University of Arizona, Tucson, Arizona.

Costs of Pumping Water Compared

Check Expenses of Electric & Gas Power On 40 Irrigation Wells in Pinal County

By Rex D. Rehnberg
Department of Agricultural Economics

What does the falling water table cost the farmers of Arizona every year in the way of higher power costs and increased repair bills? Is electricity or natural gas the cheapest source of power? These, and many similar questions, are commonly heard in the pump areas of Arizona.

Recently a study was initiated at the University of Arizona to help answer such questions. During the summer of 1951, a sample of wells in Pinal County was selected for detailed analysis in order to provide data on current pumping costs. By the time the study was completed detailed cost records had been secured on 20 natural gas wells and 20 electric wells.

Two Methods Used

Two methods were used to compute the cost of pumping water. First, there was *total cost*. Total cost of water includes a charge for interest on the present replacement cost of the well and a charge for depreciation on the well and equipment.

When using this method the pump and power unit was depreciated in five years and the well in ten. This rapid write-off was adopted because of the uncertainty involed in the installation of a new well in some of the critical water areas of the State.

The second method used was *operating cost*. Operating cost includes such items as power, lubricants, repairs, attendance and taxes but does not include a charge for interest on investment or depreciation. This figure is an approximation of the cost of continuing to operate the existing wells but makes no charge for replacing the well once it is depreciated.

Costs Vary

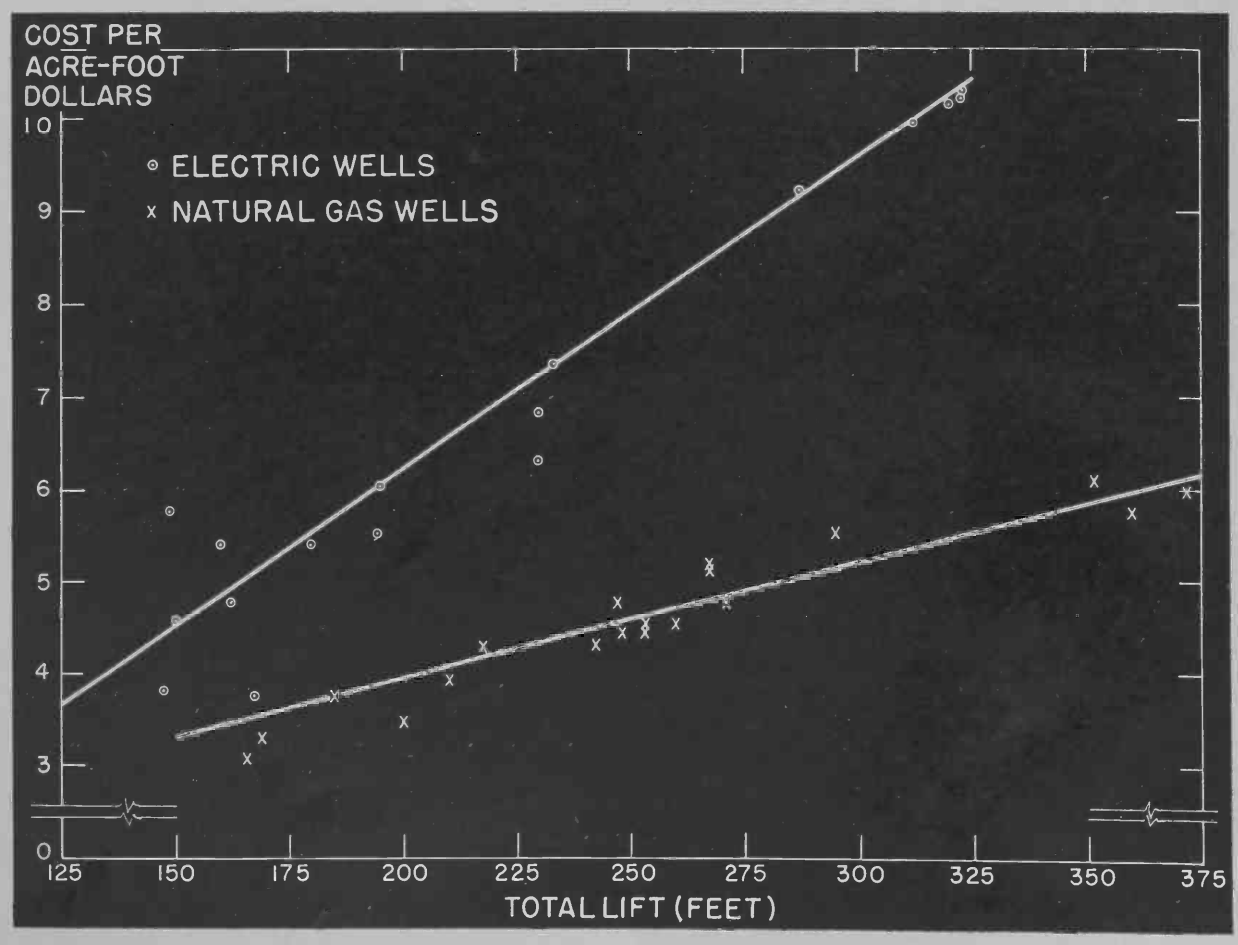
The total cost of an acre-foot of water varied from about $7.50 at a 150 ft. lift to $16.50 at 300 ft, for electric wells. This is an increase of approximately $6 per acre-foot for each 100 feet increase in lift. For the natural gas wells the cost per acre-foot increased from about $6 at 150 feet to $12.75 at 300 feet. This represents an increase in cost of $4.50 per acre-foot for each additional 100 feet of lift.

Above is a natural gas powered water pump in the Pinal County area. On the cover of this issue of Progressive Agriculture is shown an irrigation well pump powered by electricity, also in the Pinal area.

Most farmers are not interested in interest and depreciation costs once a well is installed. The operating costs, or annual cash costs, are the ones that determine whether a well will continue in operation once it is installed.

The operating cost per acre-foot of water increased from around $4.50 at 150 ft. lift to $9.50 at a 300 ft. lift for the electric wells. This represents an increase of approximately $3.25 for each additional 100 feet of lift. For

(Please turn to page 12)



The operating cost advantage of natural gas over electricity increase is the lift increase. The chart shows annual cash costs only.

They Cook In a Big Way

Quantity Food Preparation Taught In School of Home Economics at U

By Mary Adele Wood
School of Home Economics

A Peggy (Mrs. Marie) Lyle is here shown in the bake shop carefully weighing dry materials before baking.

Students planning to be dietitians or food service directors need training in quantity food preparation and service. Institution Food Management is taught the first semester of each year at the University of Arizona.

Through the cooperation of Mrs. Betty Jane Saunders, class members have excellent experience during their laboratory periods which are held in the new Student Union Building with its two cafeterias, soda fountain, and banquet rooms.

One question always discussed in this class is, "Are standards of high quality different for foods prepared at home and in the institution?" Some students say "no" and others an emphatic "yes." Certainly everyone will agree that customers return only when the food is always "tops."

Students learn that some of the ways to consistently obtain high quality food are:

1. Selecting and using tested recipes.

2. Purchasing materials best suited for food to be prepared. For instance, every large institution keeps at least three kinds of flour on hand all the time.

3. Watching food storage so the bread doesn't mold and the milk sour, and that all foods are at the peak of perfection when used.

4. Selecting and training employees. Few cooks have had the privilege of formal training. Their knowledge, like Topsy, has just grown.

5. Scheduling workers so their time will correspond to their duties. One result of too much work and too little time is food of poor quality.

6. Checking the finished product. Food should be tasted by both the cook and the manager. A student supervisor once asked the cook if she tasted everything she prepared and received the reply "certainly not, if I did I'd have ulcers." Thereafter the student did the tasting and the cooks' eyes followed every movement.

Methods Vary

Some methods of food preparation in the home and in the institution are the same but often when foods are prepared in quantity the technique used or the equipment or both may be different. For example, in baking in the institution the dry materials are weighed instead of measured.

It is not necessary to sift the flour before weighing, so one step is eliminated. To save time, dry materials which are to be combined are weighed one on top of the other, taking care to weigh the smallest amounts first.

If the recipe calls for 4 ounces of baking powder and 5 ounces is placed on the scoop of the scale, it is very easy to remove the extra one ounce. On the other hand, if four pounds of flour is weighed first and the baking powder placed on top of the flour, it is almost impossible to separate the two in order to remove the extra baking powder. Since dry materials will pack, weighing is a more accurate method than measuring for determining the amount desired.

"Flavor's the thing" and here Peggy (Mrs. Marie) Lyle is tasting before serving. Students have experience in preparing food at the range unit as well as in the salad department and bake shop.

After weighing and mixing, uniform portions must be considered. Students take particular interest in dishing muffin batter with ice cream scoops and weighing cake batter in each pan. To know the amount prepared the same number of individual items such as biscuits or cookies are placed on each sheet and the pans counted.

Members of this class are often asked for quantity recipes, especially for refreshments and social occasions. Fruit punch is a universal favorite.

To prepare quickly and easily, for one gallon combine:

- 2 cans frozen concentrated orange juice, 6 ounce size
- 1½ cans frozen concentrated lemonade, 6 ounce size
- 1 can pineapple juice, No. 2 size
- 2¼ quarts water
- ½ bottle ginger ale, 1 pint, 12 ounce size.

A little sugar may be added if desired. If a large amount of ice is used, decrease the amount of water. If frozen concentrated lemon juice is used instead of the lemonade, use less of the concentrated juice and add sugar to taste. To serve the punch frosted, omit ice and add sherbet.

One gallon of punch is sufficient for thirty punch cups.

Machine Or Hand Picking?

Cotton Harvesting Efficiencies Studied

By E. R. Holekamp
And K. R. Frost
Department of Agricultural Engineering

Machine picking efficiencies of cotton have been found lower than hand picking efficiencies in the past three years. Machine harvesting efficiencies in Arizona 44 Acala of 81 percent were obtained in 1949 and 83 percent in 1950.

These harvests were made with two machine pickings. The first picking was in October or early November in undefoliated cotton and the final picking in December. One and two-row barbed spindle machines were used, each giving similar results.

Hand harvesting efficiencies under comparable conditions were about 95 percent. The harvesting efficiencies used as a basis for comparison is the percent of pickable cotton harvested. Cotton which had fallen to the ground before each picking was considered as storm losses and not as pickable cotton.

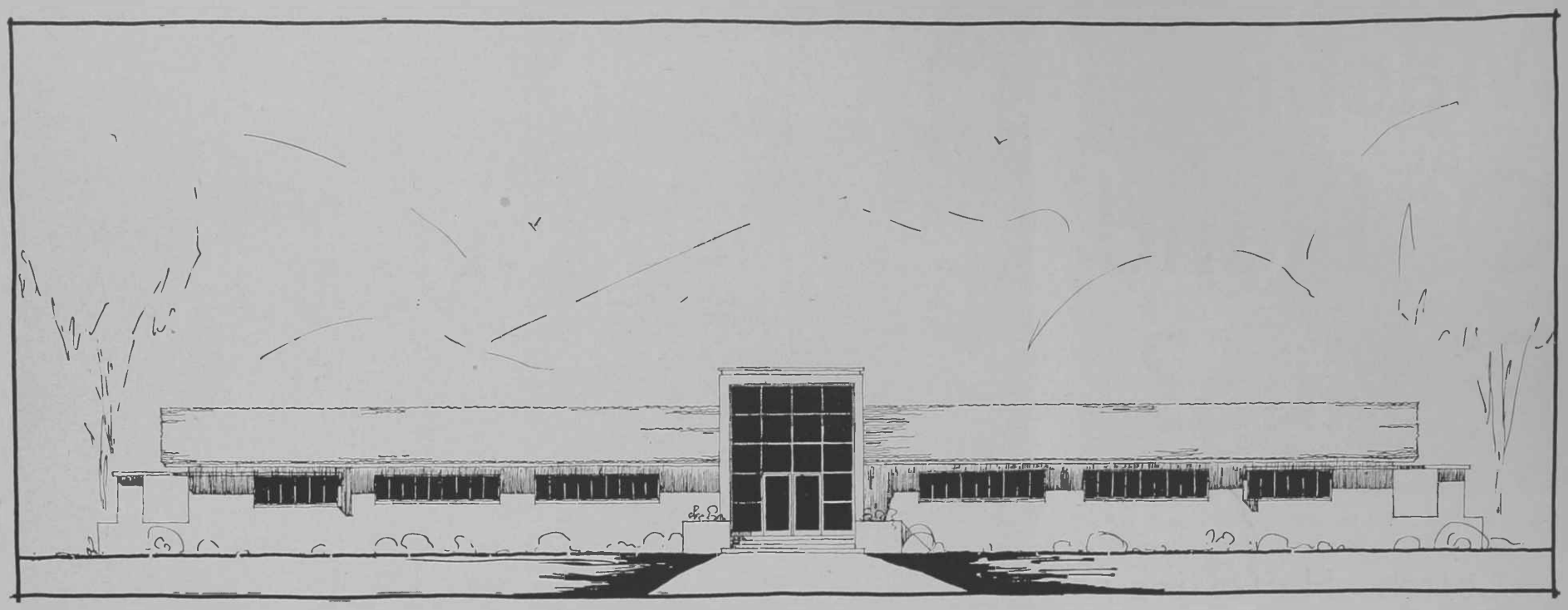
▲ The harvesting efficiency of the mechanical picker in this plot of defoliated Arizona 44 cotton was 83 percent. The rows to the right were picked twice, November 6, after defoliation, and again December 9, 1950, after frost. The cotton remaining after the first picking is shown by the rows on the left.

Defoliating the cotton in a test plot of Arizona 44 Acala did not appreci-

(Please turn to page 11)

▼ The machine picking efficiency was 84 percent in this field of defoliated Arizona 44 cotton. The rows on the left were picked October 4, 1951. Losses of cotton dropped to the ground amounted to 4.5 percent of the yield of this date. Thoroughness of defoliation varied from 50 to 90 percent of the leaves through the field.

▼ The shattering of bolls of cotton when machine picking in frozen and brittle cotton is shown by the row on the right. The machine picking was in Arizona 44 cotton on December 9, 1950, three weeks after frost. This picking harvested 83 percent of the cotton. The heavy losses are indicated by the shattered bolls on the ground.



Your Farm Research Lab!

New Center to be Located On University's Mesa Farm

New buildings and facilities to be installed at headquarters of the University of Arizona Agricultural Experiment Station at Mesa indicate clearly the confidence which Arizona farmers and ranchers have in the present and future value of research.

These new facilities are to be constructed with an authorization of $215,000 from the 1952 session of the Arizona Legislature. They will be put into operation at the earliest possible moment for there are a number of problems waiting for answers. In fact, insect and plant disease problems have become so acute this year that an entomologist and a plant pathologist started working even before ground was broken for the new facilities. These men have been working from temporary quarters with their "laboratories" in their automobiles.

Mesa Station Laboratory

Foremost on the building program for the Mesa Station will be the main building with about 10,000 square feet of floor space. This building will probably be called the "Mesa Station Laboratory" (see picture above). It will provide offices and laboratories for technicians of the Arizona Agricultural Experiment Station and the State Chemist.

Experiment Station operations planned for the immediate future in connection with the Laboratory will include work by the departments of horticulture, plant pathology, entomology, and soils. The offices and laboratories of the State Chemist in the new building will be used for analytical work on feeds, fertilizers, insecticides, and agricultural minerals which has been heretofore carried on in the College of Agriculture Building in Tucson.

In addition to seven specialized laboratories and ten offices, the new building will contain soil preparation and nitrogen rooms, a seed analysis room, a photographic darkroom, four temperature control rooms (for vegetable storage investigations) and a room to be used as a conference room and library.

Other facilities included in the building program are three 25-foot greenhouses equipped with a headhouse. A 40′ x 40′ utility building for storing and mixing fertilizers and insecticides and for storing seeds will also be constructed.

Attached to this utility building will be a seed storage room made available by a special appropriation of the Arizona Crop Improvement Association. This storage space will be used by the A.C.I.A. in its seed improvement work, much of which is carried on cooperatively with the University.

A feed mill building for storing, grinding and mixing feeds, and eight cattle-feeding lots each 60′ x 60′ with necessary working lots are to be built for an expanded animal husbandry program. It is anticipated that all parts of the building program will be completed by mid-summer 1953.

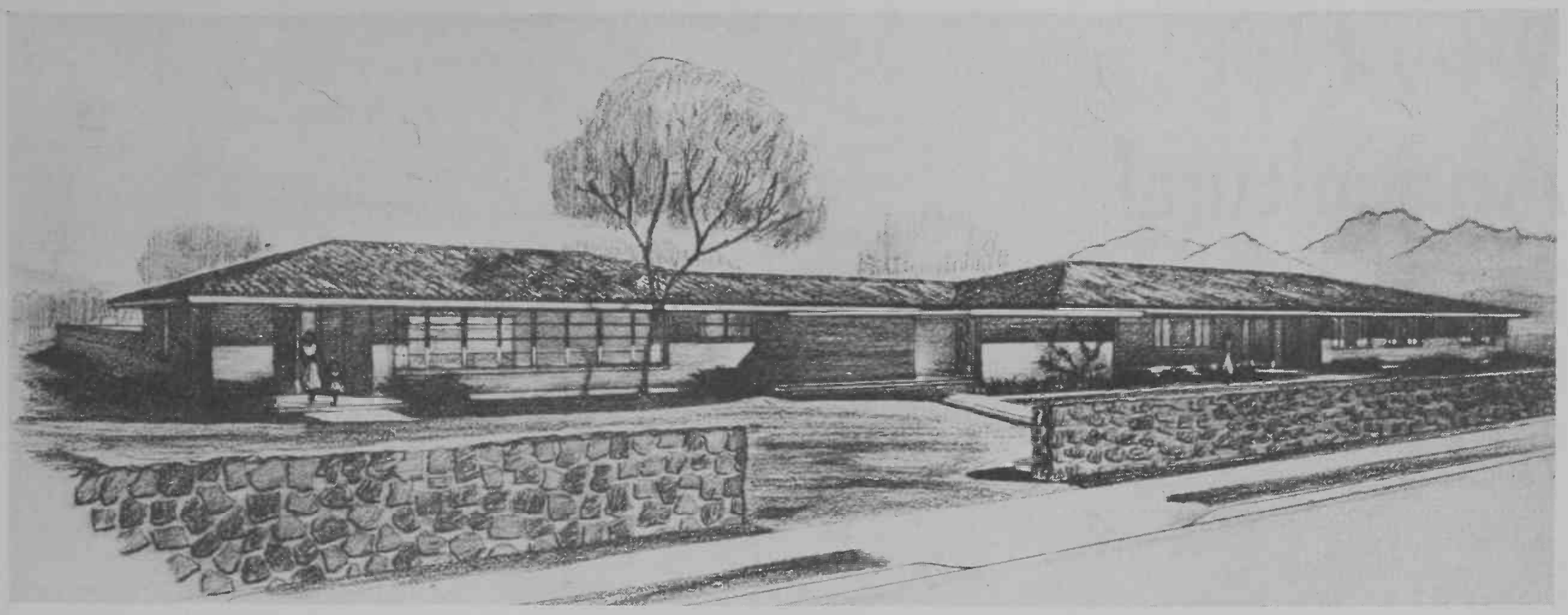
To Help Meet Food Needs

These new research facilities are directly in line with the nation-wide effort to meet the food and fiber needs of the future. Our national population is growing at the rate of two and one-half million people a year. Since about three acres of cropland equivalent are needed to produce the annual food and fiber needs of each person in the United States, there are needed annually the equivalent of seven and one-half million acres of new cropland to feed and clothe the additional population.

According to present best estimates, there are about forty-five million acres that can be economically added to our present agricultural production area. Even if these forty-five million acres were added to our present cropland area at the rate required by our increasing population, which is very unlikely, they would last only six years.

The demand of the future can be met only by making better use of the land we already have. To accomplish this, we must look first toward **research,** for research is the living source of progress.

The new research programs planned for the Mesa Station have been designed with this necessity in mind and should contribute significantly not only to Arizona's agricultural problems but to those of the Nation as well.



New Home Ec Building

Home Management House and Nursery School on U Campus

The new Home Management House and the nearby Nursery School pictured above are to be built on East Second Street and North Cherry Avenue in Tucson at a cost of $80,000. Recently approved by the Board of Regents, the two new buildings are the first step toward completely modernizing the present facilities for the School of Home Economics.

The Nursery School building consists chiefly of one large playroom with a dining corner and an alcove sleeping room, a small kitchen, office, observation room, toilet room and storage room. A long shady covered porch and a big yard for playground equipment will provide ample play space for twenty youngsters.

Mothers will notice many interesting details, such as the pass-through opening from the kitchen onto the play porch (so that fruit juices, etc., can be served easily without kitchen invasion); the child-sized toilets, lavatories, and lockers; and the handy storage for tricycles and other outdoor toys.

"Utility" Featured

The Home Management House next door provides living quarters for the "family" of six girls, the infant member of the group, and the supervising instructor. The "family" will probably be most proud of their efficient kitchen and nearby utility room with equipment for laundering, pressing, sewing and flower arrangement.

They will also enjoy their living room with glass doors opening onto a terrace, the dining room which can be made one with the living room for occasional Home Economics functions, their bedrooms with good study and storage arrangements, their compartmented bath to aid the morning rush, and the tiny nursery with its bath corner and carriage porch.

Plan for New Furnishings

Like most families this one will take many of the old furnishings and equipment with them into their new house, and will spend many long hours planning for the furnishing of their long-dreamed-of new home.

A feature of the dining room is the specially planned storage wall with an opening between the kitchen and the dining room. The "pass-through" will save many steps during the serving of meals.

The storage shelves, which open both to kitchen and to dining room, have been planned for the china, glass, and table appliances for both guest and everyday meals. Even the extra table leaves have not been forgotten and slide into their special rack. Tray-shelves for linens allow the flat storage of linens in good shape.

A specially designed wall separates the dining room from the living room and can be pulled back so that the two rooms become one large room when large groups are entertained at tea and other functions. The girls also hope to use the large terrace just outside the living room for entertaining.

Each Girl "Takes Her Turn"

The home management course at the University requires residence in home management house. Here each girl takes her turn at the many jobs included in managing a home. Meals are prepared and served to fellow students and the instructor. Some nights faculty guests or student "dates" are entertained.

Baby care is the responsibility shared by students in residence in home management house too. During her week as child director the student takes full charge of the child and arranges for student "baby sitters" when she is at class.

Child development is a family-life course in several home economics majors. Students assist and supervise nursery-school routines. Through such practical experience they gain skill in child guidance, and the nursery school becomes a very important laboratory.

Why Not Agricultural Economics?

By Jimmye S. Hillman
Department of Agricultural Economics

Meet the youngest member of the agricultural family — the agricultural economist!

He was born of necessity to help solve problems which have arisen due to the commercialization of agriculture. His generation speaks of the machine, technological change, specialization, dollar receipts, and the income tax, but not the 19th century language of self-sufficient farming and domestic self-containment.

Farmers Must Sell

Today farmers must sell their product. The job of the farm economist is intimately linked with the efficient production and marketing of that product. The field of the economist is, therefore, the broad business aspects of farming. He is not only vitally interested in high production rates, low production costs, and easing the work-load of the farmer, but also in the manifold processes involved in transporting, processing, distributing and servicing the farm product.

The field of agricultural economics usually is divided into two categories — production economics and marketing. Three other branches of study — agricultural policy, statistics, and rural life — may be linked to the field but are of lesser direct importance. Chart I shows the constituent parts of the greater field.

Agricultural economics offers many opportunities to the student who wants to pursue graduate study. Many institutions offer the Ph.D. in almost any phase of the special fields shown in Chart I. Academic requirements are being increased for those who wish to hold many professional positions.

Job opportunities open to the holders of the bachelor's degree vary widely and are almost unlimited. About the only employment doors which are closed to him are those specialized positions in government and state institutions which require a great deal of technical training.

Many Job Opportunities

Chart II points out a number, but not all, of the job opportunities open to the holder of the bachelor's degree and to those who hold higher degrees. Agricultural economists are preferred for certain positions because of their familiarity with statistical technique and agricultural policy.

(Please turn to page 12)

Chart II. Job Opportunities Open to the Agricultural Economist

To Holders of Bachelor's Degree

1. In Domestic Agriculture:
   a. Farm or Ranch Managers.
   b. Cooperative Managers.
   c. Junior Executives with Cotton Companies.
2. In Commercial Work:
   a. Sales Representatives for Feed, Seed, Fertilizer, Machinery and Insecticide Companies.
   b. Agricultural Representatives for Commercial Banks, *e. g.*, Appraisal and Consultant Service.
   c. Cotton and Livestock Buyers.
   d. Plant Managers for Packing Houses or processors.
3. In Government With:
   a. Extension Service — County Agents or Specialist Positions.
   b. Production Marketing Administration.
   c. Farm Credit Administration.
   d. Commodity Credit Corporation.
   e. Farmers Home Administration.
   f. Reclamation, Forest, or Soil Conservation Services.
   g. Foreign Agricultural Relations Work.
4. Field Representatives, Workers or Analysis for Various Public or Private Agencies.

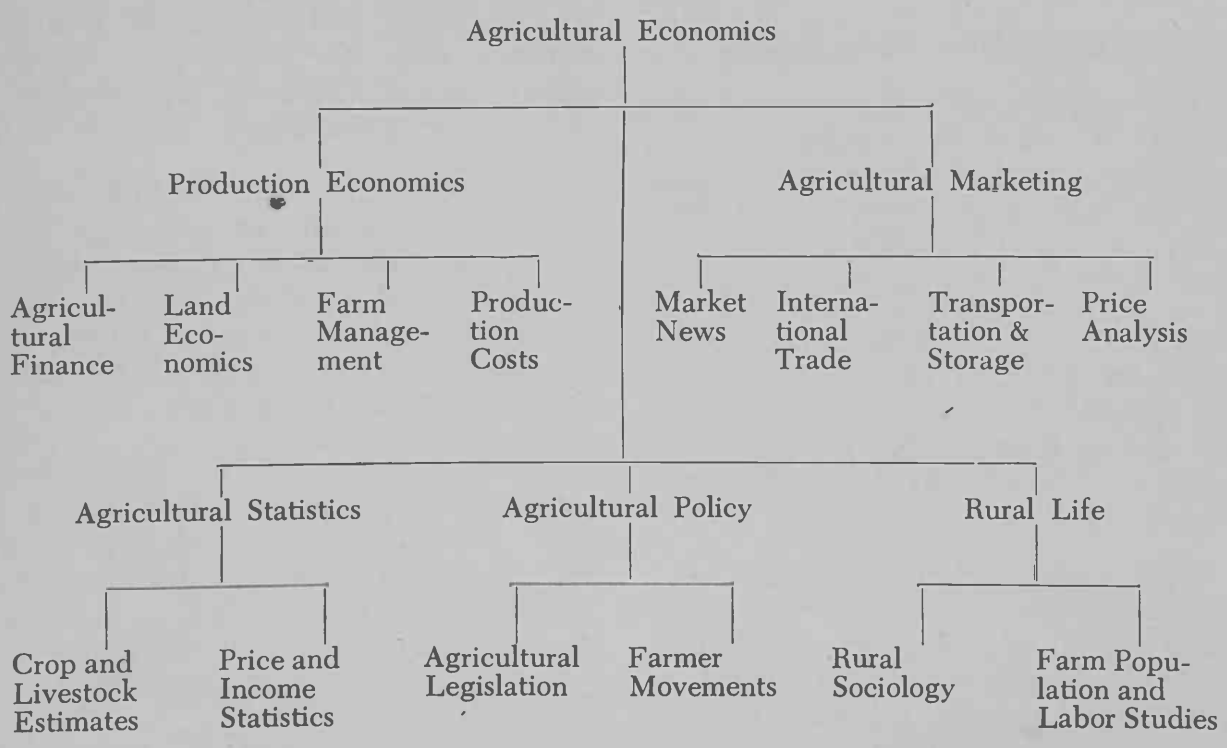
To Holders of Advanced Degree

Note: Holders of advanced degrees may find positions in all the fields listed in the opposite column. Moreover, there is an increasing tendency for all positions in public and private activities to favor the student with more training.

In addition to those jobs which are open to students with the bachelor's degree there are:

1. Teaching positions in Colleges and Universities.
2. Public Research Positions:
   a. State Agricultural Experiment Stations.
   b. Bureau of Agricultural Economics.
   c. Other Government Research.
3. Private Research Positions:
   For example:
   a. Doane's Agricultural Service.
   b. National Cotton Council.
   c. National Bureau of Economic Research.
   d. Industrial Commodity Corporation.

Chart I. The Field of Agricultural Economics



Late Spring Lettuce

Seek Varieties Best Suited to Higher Priced Market Season

By R. E. Foster
And J. K. Stewart
Horticulture Department

Analysis of market reports reveal a trend toward higher prices paid for lettuce during the late spring season. With an increasing interest among Salt River Valley growers to extend the usual lettuce growing season to meet this market, a study of lettuce varieties suitable for the late spring season seemed advisable.

In 1951, forty lettuce strains were assembled and planted on the University of Arizona Mesa farm. Most of these were of "Great Lakes" types and many were experimental breeding lines available only in small quantities. The test was small and while data was obtained regarding various head characters, it was not possible to get accurate yield data or any data on storage or shipping quality.

Recker Farm Test

In 1952, a test was planted on the Earl C. Recker farm south of Higley, Arizona, each strain sown in a one or two acre strip adjusted in width to accommodate the modern conveyor-belt loader. In assembling the varieties and strains for this particular late spring lettuce trial, it was recognized that the season of harvest would be late for best performance of Imperial 615, the standard early spring variety.

The lettuce was first irrigated January 8, and grown according to excellent commercial practice. At maturity, each strain was harvested, taken to the shed and packed individually.

Just prior to harvest, characteristics measured were head size, color,

(Please turn to page 12)

Harvesting a single strain of lettuce with conveyor-belt loader. (May 6-11, 1952).

Lettuce strain that stored best for 31 days. (Great Lakes — Ferry Morse 366A.)

Control Mesquite BY FIRE

▲ Mesquite control by fire, Page Ranch.

Killing Even the Tops of Trees May Prove to be Very Beneficial

By R. R. Humphrey
Department of Botany and Range Ecology

The mesquite common in southern Arizona can be killed back to the ground by running grass fires. The smaller trees are usually killed back whenever there is fuel enough for fire to carry. About 10 percent of the trees that are top killed in this way do not stump sprout. As someone remarked, "It kills 'em dead and they stay dead."

The other 90 percent send up stump sprouts from the buds that are always present near or just below ground level. Unless there is fuel close to the base of the trunk, the fire may not be hot enough to top-kill the larger trees.

June Best Time to Burn

Late June, just before the start of the summer rains is a good time to burn. The kill may be almost as good, though, from late fall burns.

The fact that relatively few mesquites are killed completely does not indicate that fire has no place as a control measure. A brief analysis of the problem shows that fire may be an effective tool and that killing even the tops of the trees may be very beneficial.

Studies made at the University of Arizona have shown that mesquite is wasteful of water. Mesquite takes more than four times as much water to produce a pound of dry matter as does Rothrock grama or curly mesquite.

When the trees or their tops are killed, this moisture loss stops. Even those that stump-sprout grow very slowly and many years will elapse before they will be large enough to use more than a small fraction of the water they originally did.

One fact needs no emphasis in most of Arizona: moisture for plant growth is limited. There is not enough to go around and any used by low-forage-producing plants means that less is available to produce forage.

Although only about 10 percent of the mesquites were killed completely by burning, this does not mean that fire is never more effective than this. The 10 percent kill was observed on one burn in June and one in December. There is much that is not known about mesquite and further study may yield quite different results. There is some indication that this is so.

One report on work done by the University in 1910 stated that mesquite was killed by burning. Another, based on observations made in 1934, stated that 50 percent of the mesquite burned in each of two fires was killed.

Many Fires

There is no doubt that fires were a common occurrence at one time on most range lands now infested with mesquite. These ranges were covered with grass and burned readily from fires set by Indians or lightning. Fires not only kept mesquite from becoming established; they killed most other shrubs as well.

Although there have been few fires on our mesquite-infested range lands for at least 40 years, evidence still exists that fires did occur there at one time. A few old mesquite trees always grew along the washes where the soil was too rocky and the grass too thin for fire to burn very hot.

A recent survey was made of trees along some of these washes. The survey showed that 69 percent of the old mesquites 14 inches or more in diameter still had old fire scars that contained fragments of charcoal.

There is no escaping the fact that fire that burns up noxious plants also burns up feed. This objection can be countered by two principal facts.

(Please turn to page 12)

▼ Foothills of the Santa Rita Mountains in 1903. (Bureau of Plant Industry Photo.)

▼ Same area shown in Photo No. 1, rephotographed in 1947, after 45 years of no fires. (Forest Service Photo.)

Machine or Hand Picked Cotton?

(From page 5)

ably improve the harvesting efficiency in 1950. The efficiency for machine picking in partially defoliated cotton (50 percent of the leaves removed) in early November and again in December was 83 percent.

Harvesting Arizona 44 Acala cotton with a single machine picking in December was found just as efficient as machine pickings in early November and again in December. But unfortunately, data on the effect of late season machine harvest on grades were not available.

The grades of machine picked cotton in 1949 were M to SLM, and in 1950 were SM for the first picking. These compared favorably to grades of M and SM of hand picked cotton in 1949 and 1950, respectively. The quality of the second machine-picked cotton in 1949 was a grade lower than that of the second hand picking, SLM and M respectively. In 1950, the grades for the second machine picked cotton were LM. Grades of machine-picked cotton were not improved by defoliation in 1950.

Varieties Checked

The performance of machine pickers in three Arizona cotton varieties, 44, 33 and 28, was observed during 1951. Picking efficiencies in partially defoliated cotton were found to be highest in the 28 variety between 90 to 93 percent and lowest in 44 at 85 percent, with efficiencies in 33 ranging from 86 to 93 percent. For further details refer to the table on page 11.) These picking efficiencies were based on individual pickings of machines in different localities and under varied field conditions and are not seasonal harvesting efficiencies as given for 1949 and 1950.

Storm losses were highest in the 28 variety, averaging 8.5 percent in late November. The maximum storm losses found in 33 were 3 percent in late November.

No field checks were made in the 44 variety after mid-November when the storm losses in the other varieties were prevalent. In previous years the storm losses in 44 were negligible. Thus delayed harvesting in less storm resistant varieties, although desirable for machine picking, may result in high total losses for the season.

Picking efficiencies in green cotton were generally lower than in partially defoliated cotton during 1951. A separation of the machine losses into cotton dropped on the ground and cotton remaining on the plants unpicked indicated that the amount of cotton left on the plants increased more than the amount of cotton dropped to the ground. This was evident in the 44 and 28 varieties where the cotton left on the plants in green cotton was almost double that in the partially defoliated cotton.

Machine Picking Efficiencies in Three of Arizona's Cotton Varieties

Date of machine picking and field conditions	Storm losses, percent of yield	Picking efficiency, percent of pickable cotton (storm losses not included)	Cotton remaining on the plant, percent of the pickable cotton
Arizona 44 Acala			
Oct. 4 undefoliated	Nil	74.0	20.3
Oct. 11 defoliated 70%	Nil	84.9	10.0
Arizona 28 Acala			
Oct. 4 undefoliated	Nil	82.7	10.5
Oct. 25 defoliated, 50%	Nil	93.2	3.4
Nov. 30 after frost	8.5	90.3	5.8
Arizona 33 Acala			
Oct. 19 undefoliated	Nil	86.2	8.7
Nov. 15 defoliated, 50% (some lodging)	0.5	86.7	10.5
Dec. 11 after frost	2.1	92.5	3.3

What's Going On?

Agronomists Meet

The University of Arizona was host to the Western Branch, American Society of Agronomy this summer. The program included a field trip of the Agricultural Experiment Station Research Farm at Mesa, and other points. A total of 54 delegates attended.

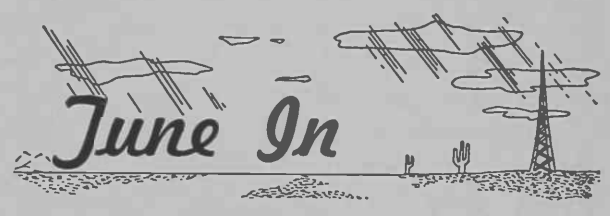
Discuss Grassland Farming

As part of the nation-wide grassland farming program County Agricultural Agents and Experiment Station staff members met September 9 and 10 at the University to discuss problems of range livestock owners. Included were range condition analyses; control of mesquite, burroweed, juniper and other noxious plants; poisonous plants; managing ranges to obtain maximum returns over long periods; range improvement through reseeding.

Ag Economists Get Together

During the period July 17-27, various groups of Agricultural Economists met at Arizona State College at Flagstaff. The Department of Agricultural Economics of the University of Arizona, was host.

The meetings included: Economics of Range Resource Development Committee, Western Writing Workshop, Western Agricultural Economic Research Council, Annual Conference, Western Farm Economics Association, Western Livestock Marketing Committee.



Daily (Except Sunday)

KRUX, Glendale, 6:55 a.m.—Farm Front—Maricopa County Extension Agent.

Sundays

KOY, Phoenix, 8:45 a.m.—Demonstration Garden (County Agent) Program.

Mondays

KYMA, Yuma, 7:00 a.m.—On the Farm Front.

KCLS, Flagstaff, 8:45 a.m.—Your County Agent Reports.

Wednesdays

KYUM, Yuma, 6:15 a.m. — Yuma County Agricultural Extension Service Radio Program.

Fridays

KCKY, Coolidge-Casa Grande, 4:30 p.m.—Pinal County Farm and Home Program.

Saturdays

KTUC, Tucson, KSUN, Bisbee } 11:30 to 12:00

KOY, Phoenix, KYMA, Yuma, KCLS, Flagstaff } 1:00 to 1:30

Arizona Farm and Ranch Hour, presented by the Radio Bureau, University of Arizona, and the College of Agriculture.

KGLU, Safford, 1:15 p.m.—Stepping Along with the Agricultural Extension Service.

Late Spring Lettuce

(From page 9)

wrap, shape, butt, rib, presence of Tip Burn and Rib Discoloration for each strain. Size data were taken by individual head grading and counting from 200 feet of bed. Marketable heads included four dozen and five dozen per crate sizes only. In most of the strains, over two-thirds of the marketable heads were the more desirable 4 dozen size.

As each lot was packed in the shed, sample iced crates of fifteen strains were taken from the line and rushed to a storage room at the University of Arizona, Tempe farm. These crates were held in storage at 34°F. for thirty days, opened at room temperature for one day and then examined for keeping quality.

Best Strains Noted

Comparisons between the twenty-eight strains tested in regard to all the characteristics were made from the data assembled. Of special interest are the following: Best strains yielded well over 80% cut-out. Two strains, Imperial 615-Ferry Morse strain 383 and Woodruff's variety A36, showed poor yields.

Color was remarkably uniform between the lots, and Ferry Morse variety K1 was the best desirable dark green. There was little variation in wrap; all strains were quite satisfactory in this character. Shape was fairly good throughout.

There was more variation in rib type than in other characters. Contrary to general belief, the Imperial 615 type did not have the best ribs although their ratings were reasonably high. Desirable rib characters were shown by Dr. Thompson's #4164 which contrasted greatly with Great Lakes 428 that had extremely thick and curved ribs.

Tip Burn and Rib Discoloration are the two head maladies which most seriously affect the marketability of late spring lettuce. While neither disease appeared in severe form in the Earl Recker Farm, their presence was noted when found and the resultant ratings given varieties on susceptibility to these troubles give good indication of the suitability of the strains for the late spring crop. Dr. Thompson's #3867 was the only strain in the test entirely free of either disease.

Storage Results

The number of marketable heads left in a crate after as long a period as 31 days gives a good indication of the ability of the strain to withstand storage shipping. Of the fifteen strains subjected to the storage test, Great Lakes 428-Loomis was the best. Ferry Morse Great Lakes 1180 had the poorest keeping quality.

In this grower cooperative test conducted as a late spring lettuce variety trial for the 1952 season, Ferry Morse Great Lakes 366A was judged best of the trial on the basis of good storing ability, good head characters and high yield.

Selected Lettuce Varieties and Strains with Yield Data (28 strains tested)

Variety	Strain	Source	Yield as % Marketable Heads
Great Lakes	366 A*	Ferry Morse	82.4
Great Lakes 59	67095	Associated	84.9
Great Lakes 428	1-505	Loomis	66.3
A 36		Woodruff	45.4
Special	3188	Thompson U.S.D.A.	69.5
Special	20965	Whitaker U.S.D.A.	64.0
Imperial 615	385	Ferry Morse	69.7
Imperial 615	27563	Associated	41.8
K 1	34362	Ferry Morse	58.6

*Best of 12 Ferry Morse Great Lakes Strains tested.

Why Not Ag Economics?

(From page 8)

The Agricultural Economics Department at the University of Arizona has outlined a course of study which best prepares the student for work in the diverse group of positions listed. It offers the Master's Degree for those who care to pursue graduate study.

Students interested in this field — the business aspects of farming — should contact the Department Head and arrange a program of work which will best achieve their desired goals or which will put them in positions of high demand upon graduation.

Control Mesquite By Fire

(From page 10)

The first of these is that everything, even range land, costs something to maintain.

The second is that if burning is done in June, the summer rains and new feed are just around the corner. Cattle won't eat the dry feed anyway when the green feed comes on. One has to decide whether he can afford to sacrifice a little feed today to do a job that 10 or 20 years from now will cost twice or four or ten times as much.

Need Grass to Carry Fire

The major obstacle to burning today is the lack of grass to carry a fire. In some places and in some years this is true. In a thick stand of mesquite the trees use up all the water and little grass can grow even without a hoof of stock on the ground.

However, there are still many areas where mesquite, cholla, burroweed and other shrubs are just coming in that will burn in some years. In places of this sort fire can be used effectively in maintaining and improving a range.

Costs of Pumping Water Compared

(From page 3)

natural gas wells, an increase in lift from 150 to 300 feet resulted in an increase in operating costs from $3.25 to $5.25, or $1.33 per additional 100 feet of lift.

The cost advantage of natural gas over electric wells is much less at the shallower lifts. As the lift increases, the cost advantage of gas over electricity increases. This relationship is a result of the high initial installation cost for a natural gas unit coupled with a steeply graduated natural gas cost rate. As the amount of gas used per month increases, the average cost per unit decreases rapidly.

Other factors such as dependability, convenience and initial cost should, and do, influence the type of power to be selected. Under conditions as they exist at the present time in Pinal County, natural gas appears to be a cheaper source of power than electricity assuming a five year write-off on the equipment.