

SPINACH IN ARIZONA

By JOHN CLEM, '29.

High Returns Per Acre From the Vegetable Crop—Favorable Weather Conditions Make Spinach a Profitable Crop for Arizona Conditions.

MOST of the spinach produced in Arizona has been grown in the Salt River and Yuma valleys. The favorable soil and climatic conditions of the other parts of the State should also make spinach a profitable crop. The high returns per acre will probably encourage the production of this crop on a much larger scale in the future. The lower valleys having warm temperatures are suitable for fall, winter, and early spring growing. Valleys having a cooler climate make summer and early fall production possible.

The type of soil best suited to the growing of spinach is one that is medium heavy, has large amounts of organic matter, and has the ability to hold moisture. Spinach can withstand small amounts of alkali in the soil and will grow on soil too alkaline for the production of good lettuce. Light sandy soils having small amounts of organic matter give poor yields and produce a spinach of inferior quality and color. The heavy dark soils found in the river valleys of Arizona give best results. The medium red soils, after they have been in alfalfa for a few years or have been heavily fertilized with barnyard manure, give excellent yields of high quality spinach.

To get the best results spinach must be grown on heavily fertilized soil. The main requirement is a large amount of available nitrogen. This may be supplied by a leguminous cover crop, application of barnyard manure, or through the use of commercial fertilizers. If the manure is to be used 15 to 20 tons per acre is sufficient. Commercial fertilizers are of most use in stimulating the growth of young plants. When acid phosphate or sodium nitrate are applied, from 100 to 400 pounds per acre is used. From experiments conducted by the Arizona station, acid phosphate produces the greatest yields, about 65 percent over check plots. On a small scale, commercial fertilizers may be applied by hand, in furrows, three to four inches deep and mixed with the soil by a cultivator. However a machine which mixes fertilizers with the soil is preferable to the hand method.



An excellent crop of spinach, ready for harvest, growing on strongly alkaline soil near Tucson.

Commercial fertilizers are usually applied a short time before planting, although they are sometimes put on after the plants are well started. When the fertilizer is applied before planting, the planting ridges are made over it. Some of the quickly available fertilizers, such as nitrate of soda, are placed in the water furrows shortly after an irrigation and mixed with the soil by cultivating.

If spinach is to follow some truck crop, as is often the case in Arizona, the first step in preparation of the soil for planting is to irrigate the ground and disk in order to cut up all vines and weeds. After the vines have dried, the ground should be plowed about eight inches deep and then allowed to remain fallow for two or three weeks. It should then be cross plowed about ten inches deep and re-disked and leveled. A ten-inch lister is then used to make furrows, leaving twenty-two to twenty-eight inch centers. Light soils should have wider centers than the heavier soils. The centers should be smoothed down with a light roller and irrigated carefully so as not to flood. As soon as dry enough, the centers should be gone over with a light harrow to break the crust formed by irrigating. The height of the centers is important because if they are too high they dry

out quickly and if too low allow flooding. They should be just high enough to prevent flooding of the plant row. The level methods of planting are not advised as it has been found, at the Yuma valley station, that the furrow methods of planting gave 20 per cent higher yields than the level methods.

If spinach is to follow a cover crop or a heavy application of manure, these should be plowed under and given plenty of time to decompose. The ground may then be handled the same as in the above method. In the lower valleys planting is done in the late fall from September 1 to December 1. In cooler places the plantings are made in early spring and during the summer. Usually two or three seedings are made at intervals of about ten days in order to lengthen the growing season. Spinach requires a cool growing season as it goes to seed quickly during hot weather. The plantings are made with either a two-row or single row drill. The two-row drill is adjusted so that it will straddle the furrows and plant the seed in rows 22 inches apart. This leaves a row of seed in the top of each center 11 inches from the center of the irrigation furrow. The seed is planted one inch deep. If thinning is to be done eight pounds to the acre is sown, with not thinning five pounds is suf-



Leaf types—left to right, Victoria, Bloomdale Long Standing, and Prickly Winter.

ficient. Thinning does not pay unless the crop is to be harvested at one cutting.

In irrigating spinach, it is important to keep the soil moist near the surface during the growing season, being careful not to flood the centers. In order to avoid flooding, the ground should be leveled carefully before planting and only a small stream of water allowed to run down each furrow during irrigation. The amount of water used and number of irrigations will depend upon the weather conditions and the nature of the soil. At the time of seed germination, if the weather is hot, water should be applied every four or five days.

The first cultivation is performed as soon as the plants are large enough to mark the rows. The early cultivation should be shallow and as near the plants as possible without harming them. The cultivations between irrigations should be frequent, in order to keep the soil moist and keep down weeds.

When the leaves have reached a length of seven or eight inches spinach is ready to be harvested. When thinning is not practiced it will be necessary to go over the field two or three times as all of the plants will not be ready to harvest at the same time. One advantage in this is that the marketing season will be prolonged over a period of three or four weeks. If the crop is to be harvested all at one time, the seeding should be heavier and the plants then thinned four to six inches in the row, as they will then be of a more uniform size and grading will not be

necessary. The method of harvesting is to cut the plants just below the crown, leaving enough of the root to hold the leaves together. After cutting, the plants are placed in boxes, roots down, and taken to the packing sheds. In the sheds all dirt and dead leaves are removed and the plants are repacked in crates lined with water proof paper. To be in good marketing condition, spinach must be clean, of good color, uniform in size, and be nicely packed.

The best variety to plant will depend upon local conditions and market demands. Both types of spinach, the crumpled leafy type and straight fleshy leafed type, do well under Arizona conditions. Canneries prefer the crumpled leaf type, although an advantage of the straight leaf type is that it holds up better on long shipments. The straight leaf type is usually preferred for commercial plantings. Some varieties which do well under Arizona conditions are Prickly Winter, Bloomsdale, Victoria and Long Standing. Prickly Winter is strongly recommended for commercial plantings because of its heavy yields and excellent quality, it is a straight leaf type. These varieties should on the average, with suitable soil conditions, produce about four tons to the acre.

Clean cultivation and rotation of crops are the best means of avoiding diseases in spinach. Clean cultivation keeps down weeds and thus helps control Rust and Downy-Mildew, which spread from weeds to spinach. Rotation of crops is the only way of avoiding hairy-root of spinach as any type

of spraying of mature spinach affects the market value. Spinach has not been harmed appreciably in Arizona by insect pests although a few insects known to feed on spinach in other places are present in Arizona.

HOW FAR DOES SHE WALK?

How far does the average farm woman walk inside the house on an average day? Some California farmers' wives checked up on this recently and found that they averaged six miles a day without going outside the house! One woman found she walked 15 miles. Measure and count your steps some time and see what they amount to, and then—see if you can shorten the distance in various ways by changing the arrangements in the home. One woman found she walked half a mile in making one cake, then she rearranged things in the kitchen and made the next cake in one-sixteenth of a mile.

MOLASSES AS STOCK FEED IN FRANCE

The use of molasses, which in France is mixed mainly with chopped straw as a feed for animals and particularly for horses, is steadily increasing, according to statistics just issued by the French Ministry of Agriculture. The deliveries from factories and sugar depots for domestic consumption by animals are shown in the following table:

1924-1925—	95,805 metric tons.
1925-1926—	127,029 metric tons.

HONEY EXPORTS

Shipments of honey from Porto Rico to the United States during October, 1926, amounted to 144,646 pounds as against 225,520 pounds during October, 1925. Hawaiian exports of honey to the United States during the same period were 261,783 and 213,182 pounds respectively.

The Borden Company has purchased the Maricopa Creamery at Tempe, Arizona and will immediately enlarge and operate it as one of the permanent plants to manufacture Borden's evaporated Milk. It will be known as Arizona Plant No. 1 of the Borden Western Company and will mark the first entry of the Borden Company, America's oldest manufacturer of canned milk, into Arizona.

Clean drinking water and plenty of green feed help keep poultry in good condition.