# Direct See

F. H. TAKATORI

GROWERS are interested in the feasibility of the establishment of commercial asparagus plantings by direct seeding as well as by the crown planting method presently used. The direct seeding of asparagus, although not a new idea, has not been used extensively because of many cultural difficulties. However, it does offer the possibility of the rapid establishment of commercial plantings at lower initial cost with higher plant densities than are now being used.

**PHOTO ABOVE:** Direct-seeded asparagus planting showing two rows of asparagus seedlings in the bottom of a wide bottom furrow.

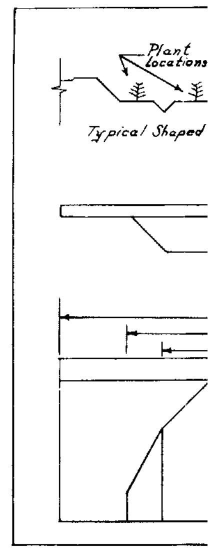
**RIGHT:** Diagrammatic drawing of the bedshaper used to form planting beds for the direct seeding of asparagus.

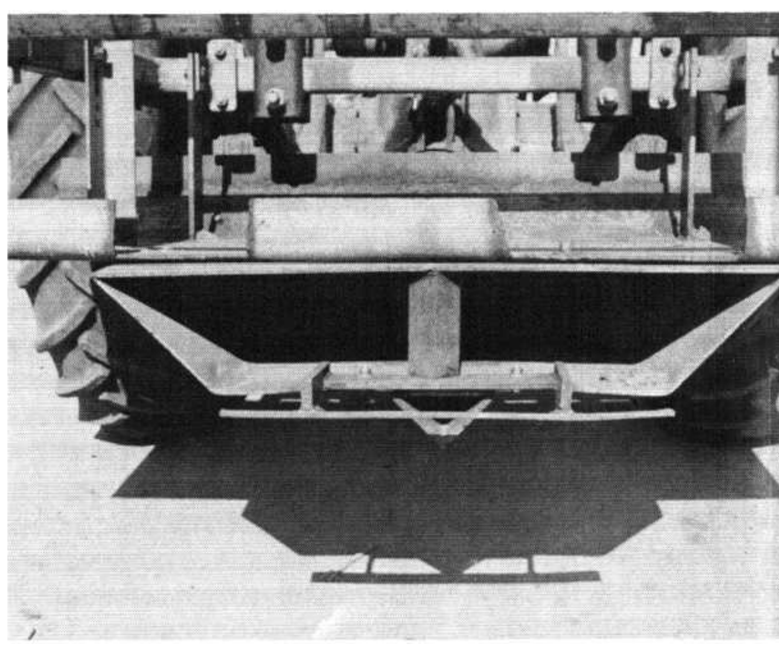
**LEFT:** Plant shield was attached under spray unit to protect asparagus seedlings from spray injury.

**BELOW LEFT:** This single-row bedshaper with two planters mounted on rear tool bar was used for experimental plantings.

**BELOW CENTER:** Rear view of an asparagus bedshaper showing angle iron used to mark a small furrow and as a soil loosener.

**BELOW RIGHT:** This two-row shaper-planter was developed by Tosh Hasagawa, San Diego, and includes four tape planters mounted on the rear tool bar for precision planting (also cover photo).

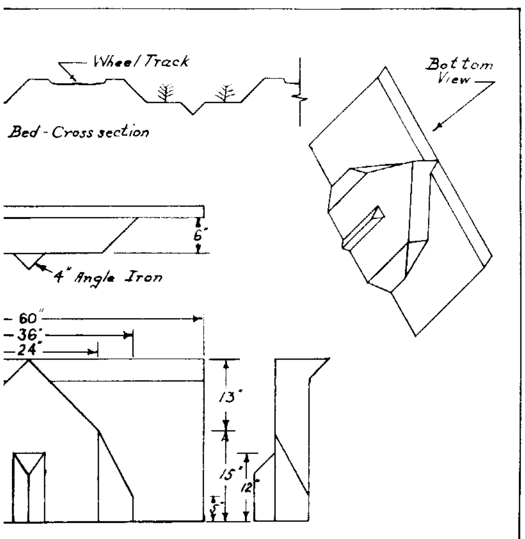


# ding of Asparagus

J. I. STILLMAN B. POWER

Successful test plantings have been grown at the University of California, Riverside, since 1966. Many growers in southern California have had equal success. This article summarizes the method used at the Citrus Research Station, U. C., Riverside, and is intended primarily to point out difficulties that were encountered and the equipment used at Riverside. It is suggested that growers try small test acreages initially to determine whether this method is suited to their farming operations, however, the direct seeding of asparagus is not recommended at this time because of insufficient performance data.




Most commercial plantings of asparagus crowns are made at a depth of beteen 8 and 14 inches. A grower may choose to vary the depth of his planting according to soil type or type of asparagus grown (white or green, etc.), but it is general practice to place the asparagus crowns well below the soil surface.

## Soil cover

To be sure of having sufficient soil to cover the crowns, the direct seeded asparagus plantings are made in the bottom of a preformed, flat-bottomed furrow (see photo). The field was premarked with a 10- to 12-inch deep furrow made with a double mold board plow and the beds were formed with a bedshaper, as shown in photo and sketch.

The preformed beds were 60 inches wide. The bottom of the furrow was 24 inches wide, leaving approximately 28 inches on top of the ridge. It is recommended that a packed, formed ridge be left on top of the furrows to facilitate the movement of such equipment as sprayers and sprinkler systems through the field as the season progresses.

## Planting and irrigation

Seed planters were attached to a tool bar behind the bedshaper (see photo). The planters were placed 14 inches apart and the seeds drilled at a depth of 1 inch. A small lateral iron bar was attached to the bedshaper to loosen the soil in front of the planter units. Specifications for the bedshaper, depth of planting, and planter spacings are not critical and can be easily altered to fit individual needs.

A 2-row bedshaper and planter (see photo) was developed by a grower in southern California. Some growers have found it advantageous to form the beds months prior to planting in order to germinate and destroy weed seed on the soil surface before planting.

The germination of asparagus seed was satisfactory under both furrow and sprinkler irrigation. The germination was retarded or reduced in areas of the field where water had a tendency to stand. In light sandy soils there were no problems in furrow irrigation where the water flowed over the seed row. However, in heavier soils, crusting was a problem.

Both furrow and sprinkler irrigation were used after the seedlings had emerged. There appeared to be some foliage injury to the young seedlings irrigated by sprinklers during August and September when the weather in Riverside was extremely hot; however, the plants were not destroyed. Comparative studies of the two methods of irrigation of asparagus are in progress.

The small angle-iron furrow marker (shown in photo) was attached to the bottom of the bedshaper to depress the soil. The small furrow aids in furrow irrigation, reducing the possibility of water standing over the seed row. It was also used as a marker for the weed control equipment.

## Weed Control

The greatest drawback to the direct seeding of asparagus was the difficulty of weed control. Most of the herbicides tested either showed some symptoms of toxicity, or eradicated the asparagus seedlings. Studies testing numerous herbicides, both as preemergence and postemergence treatments are now in progress. A few herbicides show promise for weed control in asparagus seedlings but they need further study.

Certain cultural practices were used in Riverside and are suggested as a way to control weeds until a suitable herbicide is available. Asparagus seed germinated slowly, taking about 30 days during the early spring when the weather was cold, and between 14 and 17 days during the summer in Riverside. Just prior to the emergence of the seedlings (one or two days), the entire field was sprayed with carrot oil or Paraquat. The initial spraying destroyed all the weed seedlings for a period of two to three weeks.

### Plant shield

Subsequent control of weeds was accomplished by attaching a plant shield (see photo) under the sprayer to protect the seedling, and by spraying the entire area. The center bullet-like tracker was filled with sand to add weight and the two shields were mounted directly to the tracker. The shielding unit was attached to the sprayer on chains to allow the unit to move independently of the sprayer. Because of the independent mobility of the shielding unit, two or three units could be adapted for large area coverage in commercial operations. All the weeds could be controlled effectively by this method during the seedling stage, except those between plants. It is possible that the width of the shield could be reduced to less than 2 inches for more effective weed control.

After the plants reach approximately 1½ ft in height, annual grasses and broadleaf weeds are not detrimental to the establishment of a stand. Perennial weeds should be destroyed prior to seeding or they will be a continual source of difficulty to the grower.

Weeds that appeared late in the season were permitted to grow, because they were destroyed later when the soil was moved from the top of the furrows over the asparagus plants when the beds were prepared for the following season.

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# *Evaluation of* SOIL *In Imperial*

F. E. ROBINSON • D. W. CUDNEY

J. P. JONES

**Gypsum is added to irrigation water to increase soil intake rates in some areas of California. More than a third of a ton of this compound is already present in each acre foot of irrigation water as it is delivered to farms in the Imperial Valley. Tests were conducted at the Imperial Valley Field Station to determine whether the addition of other soil amendments would increase the soil intake rates. These tests were conducted with three compounds commonly used by growers in the area as soil amendments: calcium polysulfide, ammonium polysulfide, and sulfuric acid. Water treated with these compounds was compared with untreated water in a randomized block design. Only ammonium polysulfide produced a significant increase in soil intake rates.**

THESE TESTS WERE conducted on a silty clay loam soil which was furrowed on 40-inch centers. Water was applied to the 300-foot furrows through gated pipe. A conventional inflow-outflow measurement was obtained with a stopwatch to determine the rate of fill of a known volume container. Inflow was recorded at the pipe outlet. Outflow was recorded by measuring the flow from plastic pipe inserted through earthen dams at the low end of the furrows. The measurements were obtained from every third furrow in the field. Each treatment was replicated four times.

The fluid chemical additives were applied in the irrigation water. A container with the correct quantity of additive was used on each furrow, and the additive was slowly metered into the water that flowed from the gated pipe. All of the material was added before the water reached the outflow point. This was done to prevent loss of the material in the drainage water.

### First test

The first test was conducted on March 31, 1965 with an application rate of 20 gallons per acre (gpa) of calcium polysulfide, 16.5 gpa of ammonium polysulfide, and 13.6 gpa of sulfuric acid. These rates were equivalent to 62.5 lbs per acre of sulfur. The test was conducted over a 48-hour period; the first two replications were completed on the first day, the second two replications on the second day.

The variance of infiltration rates after 20 hours was analyzed. Results showed no significant effects from the treatment. However, a wide difference in inflow rates on the first and second day prompted

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