

Mechanical Thinning on the Company Farm in the Red River Valley

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Mechanical harvesting being well established, the remaining hand labor problem rests on our ability to develop methods which will eliminate or substantially reduce our labor requirements for thinning.

Our 13 years experience on the company-operated farm have given a wide range of experience under all conditions. Progress during this period, though not sensational, has been encouraging as results from mechanical thinning have shown returns equal to hand thinning when consideration is given to the reduction in costs.

In analyzing these results, we find that initial stand is the one factor controlling the final results. Until we are reasonably certain that fair to good uniform stands can be produced under almost all conditions, we hesitate to recommend mechanical thinning as a general practice.

This area being entirely dependent on rainfall for its moisture, a timely rain occurring during the planting season has been necessary to produce the required stands. Weed and multiple plants in the blocks are controlled largely by the size of the established block when cross blocking, blocks one to one and one-half inches in width with a 3-inch strip down the row will provide this control. Stands which will permit this size of block and a minimum of 16,000 beet-containing blocks in an acre will assure yields equal to yields from hand thinning and at a substantial reduction in costs.

It is obvious that the problem has been, and will continue to be, the creation of soil conditions which will promote germination under adverse moisture conditions. Results this past season have been encouraging in this respect, as we brought our field to an excellent stand with only .16 inches of rainfall in May. We attributed our success this season first to the very shallow cultivation and the liberal use of the harrow in preparation of the seed bed, second, to the use of a cultro-cultivator mounted on a tractor with the rotor operating ahead of each furrow opener. This permitted the furrow openers to operate at a uniform depth and the fine mulch produced by the rotors made an ideal cover for the seed and maintained, and possibly hastened, capillary action of subsoil moisture. It is to be noted that the planter was equipped with standard furrow openers and press wheels.

The following is the accumulated data covering our 1951 mechanical thinning on the company farm:

Acreage: 34.58.

Crop History: Three-year rotation: 1949—barley, seeded to sweet clover, 1950—sweet clover summer fallowed; 1951—sugar beets.

Seed Bed Preparation: Date May 16—light tillage with field cultivator followed by harrowing 3 times.

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Planter Equipment: John Deere No. 66 equipped with standard furrow openers and press wheels, cells size 12/64", rows spaced 18" apart. Tractor equipped with cultro-cultivator with rotors spaced to operate ahead of each furrow opener and set at \sqrt{Vi} depth.

Planting: Date May 17-18: Seed size 7/64" to 9/64", rate of seeding 6.7 lbs. per acre. Planter set to plant W_2 " deep. 100 pounds of 0-36-8 fertilizer applied per acre through furrow openers when planting.

Cultivation: First cultivation June 7-8: Cross blocking, cultivator equipped with discs to establish block with cultro rotors between each set of discs, pattern 2-16" and 5-14" rows with blocks \sqrt{Vi} wide.

Second cultivation June 14: With planter row cultro-cultivator attachment.

Third cultivation June 28-29: Right angle to planted row, cultro attachment.

Fourth cultivation July 10-11: With planted row, with duck foot tools.

Stands: The pattern established with 2-16" and 5-14" with planter row with of 18" provides 23,916 potential beet-containing block per acre. After first blocking, 84 percent of blocks contained beets or 20,089 beet-containing blocks. Thirty-five percent of the blocks contained singles, 37 percent contained doubles, and the balance 3 or more plants to a block. This stand permits a severe treatment with finger weeder.

Finger Weeding: First weeding June 13: At right angle to planted row, 4-leaf stage. Second weeding June 20: With the planted row. Third weeding June 21: At right angle to planted row.

Labor: August 10: Hoeing 5.6 hours per acre @ .75 cents per hour—\$3.80 per acre. This compares with \$17.00 an acre by the cross-cultivated method.

Yield: 11.37 tons per acre. This compared favorably to results obtained from hand thinning, and to the Valley average, which was 11.23 tons beets per acre.

The historic practice in the Red River valley has been a pattern of 18 inches by 18 inches. A closer pattern in the row has been developed to accommodate fields having spotty stands. The development of the mechanical harvester has increased the width of the planter row and the narrower spacing in the row has been necessary to compensate for the wider planter row.

We hesitate to make specific field recommendations on the basis of results of one year, while we do feel that we have a solution to our stand problem in the use of a cultro-cultivator attachment ahead of the planter. Growers, who had the opportunity to observe the operations and results this year, are making plans to try this practice on their own fields.