Beet Population Secured with Single Seeding and Cross Blocking

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During the planting seasons of 1940 and 1941, stands resulting from use of single-seed drop drills were counted and compared with those resulting from conventional-type drills. These counts were made in fields in the Woodland area. Various growers were furnished the single-seed drop equipment for their drills and planted the tests under the supervision of the field superintendents in their districts.

Several strips of each treatment were planted in each field and staked so that counts could be made of the stands resulting. In 1941, 5 growers cooperated and planted check strips in their fields. In 1940, there were 8 eooperators.

In all tests the 50-cell single-seed drop plate was used in a Model 32 John Deere drill. The conventional-type drill was a 30-cell plate in a Model 32 John Deere drill. This Model 32 Drill with a 30-cell plate lias been used very extensively in this area and lent itself very well for making these tests.

The results reported for the 1941 tests are the average of 6 different plots. There were 10 counts made in each strip, and there were 3 strips of each treatment in each plot. The 1940 tests are the average of 12 different plots of the same set-up as the 1941 tests. The results obtained are shown in the following table:

Table 1.—Comparison of stands planted with single-seed drop drills and conventional-type drills.

	Rate of seeding-	Total plants per 100 inches	Inch spaces			Thinned stand
			Single plants	Multiple plants	No plants	
1941 tests						
Siligie-seed drop plate 50-cell	I8	32	6	11	73	102
Single-seed drop plate 50-cell	7.5	23	4	8	88	78
Conventional drill	14	93	4	33	63	116
1940 tests						
Single-seed drop plate	10	83	18	23	41	113
Conventional drill	15	121	21	33	46	119

Counts were made on the basis of the total number of plants per 100 inches before thinning. The counts were made as soon as possible after all the seed had germinated and the seedlings emerged from the ground. Bach inch space in the 100-inch count was classified as to whether it contained no plants, single plants, or multiple plants.

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For a beet every 10 inches it would be necessary to have 10 singles properly spaced in each 100 inches. In most cases this was not true. However, the single-seed drop drill spaced the seeds so that even though some of the inch spaces were classified as multiples, it was possible to thin them to singles with a hoe.

The growers cooperating in these tests found that the labor could thin stands from single-seed drop plates faster than those from conventional-type drills. An accurate check was made on one grower and the following figures were obtained:

Table 2.—Cost of thinning single-seed drop stands—1940.

	Rate of seeding	Total plants per 100 inches	Inch spaces: Single plants	Multiple plants	No plants	Thinned stand	Thinning cost per acre*	Percentage decrease in cost
Single-seed drop plants 50 cell	7.0S	67	22	18	61	119	$ 7.74	41.7
Ventura Maid	13.33	105	IS	32	50	133	12.44	6.3
Conventional drill	13.35	104	21	29	50	126	13.28	

•Thinning done by same laborers on each treatment. Actual cost per acre at 40c per hour.

The apparent reason for the reduction in cost of thinning the single-seed drop stands is due to the fact that the labor did not have to do any finger work in reducing multiple combinations to singles. It would have been practicable to thin the single-seed drop stands in this plot with a long-handled hoe. This is being done by some growers.

The use of single-seed drop plates has shown in the cases involved that practical stands of thinned beets can be planted with them. It is also apparent that labor can cover more ground thinning stands planted with single-seed drop plates. This is especially true when low-seeding rates are used.

Cross-Blocking Tests

During the season of 1941 a cross-blocking test was carried on in the Woodland area. A field was selected that was of a more or less average fertility level and that had had some watergrass in it during previous beet crops.

Stands were planted with both conventional drills and single-seed drop plates at rates of 5 to 8 pounds, 8 to 12 pounds, and 12 to 16 pounds of seed per acre for both drills. There were 3 replications of each drill and rate of seeding treatment. Blocks were laid out across these treatments for cross-blocking and regular thinning. There were 3 replications of these treatments. The results obtained are shown in table 3:

Table 3.—Results of cross-blocking seedling stands.

Pre-thinning stand

Treatment No.	Pounds of seed	John Deere drill	Total No. seedlings per 100 Inches of row	Inch spaces with single beets	Inch spaces with more than single beets	Inch spaces with no beets
~~1	5 to 8	32-cell plates	58.5	9.9	19.9	70.3
2	8 to 12	32-cell plates	78.0	12.3	25.9	61.7
3	12 to 16	32-cell plates	131.1	10.1	37.5	52.5
4	5 to 8	50-cell plates	58.8	11.3	18.7	70.1
5	8 to 12	50-cell plates	74.1	11.5	23.1	65.4
6	12 to 16	50-cell plates	79.4	11.1	25.7	63.1

Thinned stand

			Regular thinned stand		Cross-blocked stand
			Beets per 100 feet of row	Percentage doubles in 100 feet of row	Blocks with beets per 100 feet of row
1	5 to 8	32-cell plates	95.4	2.5	26.3
2	8 to 12	32-cell plates	97.5	2.8	30.8
	12 to 16	32-cell plates	112.4	1.4	45.1
4	5 to 8	50-cell plates	90.6	1.4	28.8
5	8 to 12	50-cell plates	102.2	1.0	35.4
6	12 to 16	50-cell plates	111.3	1.1	34.7

Yield

			Regular thinning	Percentage sugar	Sugar per acre	Cross-blocking	Percentage sugar	Sugar per acre
1	5 to-8	32-cell plates	17.68	15.7	5552	11.88	14.1	3350
2	8 to 12	32-cell plates	17.52	16.4	5747	12.82	15.4	3949
3	12 to 16	32-cell plates	18.25	16.3	5950	14.12	15.1	4264
4	5 to 8	50-cell plates	17.35	15.3	5309	9.87	13,7	2704
5	8 to 12	50-cell plates	19.56	16.7	6533	13.25	15.2	4028
6	12 to 16	50-cell plates	18.10	16.4	5937	13.08	14.5	3793

Conclusion

1. There is a significant difference in favor of regular thinning as compared with cross-blocking.

2. There is no significant difference between **30-cell** plate and 50-cell plate.

3. There is a significant difference in all cases in favor of groups 2 and 5 (8 to 12 pounds of seed) over groups 1 and 4 (5 to 8 pounds of seed).

4. There is no significant difference in favor of groups 3 and 6 (12 to 16 pounds of seed) over groups 2 and 5 (8 to 12 pounds of seed).

The cross-blocking was done on 20-inch centers with 3-inch blocks being left. This was done just prior to the first cultivation. The regular-thinned plots were thinned in the usual manner. At hoeing

time all plots were handled at the same time. In the cross-blocked areas some blocks were trimmed down a little if they were thick with plants.

There was considerable watergrass in these plots. When the plots were thinned the labor removed all watergrass from the rows. This was not done in the cross-blocked plots until they were hoed. The grass was quite large at this time and it was difficult to remove it from the blocks.

It appears that under the conditions of this test cross-blocking on 20-inch centers caused a significant decrease in yields of beets per acre. This is contrary to results obtained in other sections. Further tests in the Woodland area are to be carried on in an effort to find if the results obtained this year are reliable.

Cross-Cultivation of Sugar Beets

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The original intention of this work was to compare the practice of cross-cultivating beets on 20-inch centers with conventional hand thinning on a practical field basis. This practice should not be confused with cross-blocking or other mechanical means of performing the blocking of beets in the row, as a part of the hand-thinning operation.

The theory on which this practice is based is: If the cross-cultivating is done in such a maimer as to leave approximately the same population of beets per unit of row[7] or acre, the final yield will approximate that ordinarily secured under conventional hand-thinning methods.

Advantages of Method

The general use of this method was first conceived under conditions of a plentiful labor supply and low beet prices, with the idea in mind of reducing the costs of production sufficiently to provide a fair profit to the growler with existing low returns. This cultural method may now be more important as an actual labor-saving practice, particularly to reduce the number of workers needed and to enable the grower to handle comparatively large acreages satisfactorily, even if all planting has to be done in a short period of time. It is now apparent that by cross-cultivating sugar beets, any grower can properly cultivate his entire acreage and reduce the number of beets in the row in time so that there is no shock or delayed growth which

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