SEED POTATOES IMPROVED BY CLOSE PLANTING.

SUMMARIZED BY
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FROM BULLETIN BY
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Station.
Lack of agreement on the part of New York potato growers, even in the same locality, as to what spacing gives the best results, would seem to indicate that they are guided more by personal experience and observation than by experimental evidence. The method of planting, whether in drills or check rows; the distance between plants in the row; the variety of potatoes grown; the fertility and cultural condition of the soil; the size of the seed-piece, all enter into consideration in determining the proper spacing of potatoes. In addition, a planting scheme adapted to certain seasonal conditions may be entirely unsuited to different conditions. The distance between rows has been found to vary from 30 to 39 inches, and the distance between plants in the row from 9 to 36 inches. It is evident, therefore, that many factors are involved which make the problem quite complicated.

Under the planting conditions usually prevailing in Western New York, varieties of the Rural group of potatoes, such as Rural New Yorker No. 2, Sir Walter Raleigh, Enormous No. 9, etc., produce many tubers which are too large to be suitable for seed purposes. Believing that the small tubers are as productive, weight for weight, when used for seed as are the large tubers from the same plant, it was deemed worth while to study means for increasing the proportion of small and medium sized tubers. Consequently, experiments were planned to determine the feasibility of employing close spacing in the production of seed potatoes as a means of reducing the average size of the tubers without reducing the total net yield. It was thought, too, that

*This is a brief review of Bulletin No. 474 of this Station on Experiments on the Spacing of Potato Plants, by F. C. Stewart. Anyone specially interested in the detailed account of the investigations will be furnished, on application, with a copy of the complete bulletin. The names of those who so request will be placed on the mailing list to receive bulletins regularly, either popular or complete edition, as desired. Bulletins are issued at irregular intervals as investigations are completed.
thru a better understanding of the effects of different spacings, information might be obtained leading to an improvement of the quality of potatoes for table use by increasing the production of medium sized potatoes.

Field experiments were conducted at Geneva during five seasons (1914, 1915, 1917, 1918, and 1919) and comprised, chiefly, a comparison of 6- by 36-inch planting with 15- by 36-inch planting. The variety Sir Walter Raleigh was used the first four years and Enormous No. 9 the last year of the experiment. The soil was a heavy clay loam of medium fertility. The rows of thick and thin planting were alternated. At harvest the product of each row was sorted, according to weight, into four grades, viz.: (1) Under one ounce; (2) from one to two ounces; (3) from two to twelve ounces; and (4) over twelve ounces. The tubers in each grade were weighed and counted.

Detailed information is given in the complete bulletin showing the results secured each year of the experiment while the data may be briefly summarized as follows: The total number of tubers over one ounce in weight produced during the different years of the experiment varied from 41,847 to 62,600 per acre for the 15-inch planting, and from 71,603 to 97,150 per acre for the 6-inch planting, and resulted in a difference in favor of thick planting, varying from 29,281 to 34,550 tubers per acre. Expressed in another way, these figures represent yields of tubers over one ounce in weight ranging from 144.5 to 340.8 bushels per acre for the 15-inch planting, and from 191.8 to 384.4 bushels per acre for the 6-inch planting. The difference in net yield (total yield minus seed) varied from 24.9 to 46.6 bushels per acre in favor of the 6-inch planting, with an average of 34.7 bushels per acre. More than one-half of this difference, 18.7 bushels, comprised tubers over two ounces in weight.

With regard to an increase in the production of small and medium size tubers with 6-inch planting, the average weight of tubers weighing more than two ounces suffered a reduction during the different seasons of from 10.5 to 22.8 per cent. For table use, the tubers from the thick planting were thought to be more desirable in size in the 1914 and 1919 crops than those from the thin planting, but in the other three years the potatoes from the thin planting were of a better size.

As in the case of the total yield, the yield of the three smaller grades of tubers was considerably larger with the 6-inch planting than with the 15-inch planting in every year of the experiment. However, the yield of the extra large tubers, when there were any, was always greatest with the thin planting. On a percentage basis, the average increase, due to thick planting,
in number of tubers in the smallest grade was 119.1 per cent; in the one-to-two ounce grade, 144.5 per cent; in the over-two-ounce grades, 44.3 per cent; and for the total yield of tubers of all grades, 67.2 per cent.

Thick planting tended to reduce the average number of tubers produced per plant, the amount of this reduction ranging from 28.3 per cent in the 1918 experiment to 37.8 per cent in the 1914 experiment.

The largest total yields for both spacings were obtained in 1914, and the smallest total yields in 1917; yet the differences in yield in favor of thick planting for these two years was practically the same and the smallest of the series, namely, 49.3 bushels per acre in 1914, and 50.2 bushels per acre in 1917. Likewise, in the 1918 and 1919 experiments, which gave quite different total yields, almost the same difference in favor of thick planting was obtained, namely, 60.1 bushels per acre in 1918, and 61 bushels in 1919. The best results with thick planting were secured in the 1915 experiment when the difference in total yield was 83.2 bushels per acre. For all the experiments, the average increase in yield in favor of thick planting amounted to 28.9 per cent.

In a comparison of the percentage of increase in the number of tubers with the percentage of increase in the quantity of tubers, it was found that the latter was usually the higher in the two smaller grades of tubers, but considerably the lower in the marketable grade and in the total yield of all grades.

The average yield of tubers produced per plant in the 6-inch rows in 1914 was less than half that produced per plant in the 15-inch rows, while in each of the other four years the yield was slightly more than half.

The reduction in the average size of the tubers which resulted from thick planting enhanced the value of the crop for seed purposes, but its effect on the quality of the tubers for table use was less apparent. Just what size of potato is desirable for the table is largely a matter of personal opinion.

In these experiments it was decided that in a lot of tubers varying from two to twelve ounces the average weight should be about 4.25 ounces to be most desirable for general family use where some of the potatoes were to be boiled, some baked, and some mashed. Based on this standard, the crop from the thin planting was superior to that from the thick planting in three years out of the five.

Of the total number of tubers produced in the 6-inch planting during the five years of the experiment, 64.1 per cent attained a weight of two ounces or more, while in the 15-inch planting 73.9 per cent weighed two ounces or over.
Two things must be taken into consideration with regard to close spacing: First, 6-inch planting requires two and one-half times the amount of seed necessary for 15-inch planting; and second, allowance must be made for the difference in the value of potatoes in the spring and in the fall.

As stated earlier, the average net difference in favor of thick planting for the five years was 34.7 bushels per acre, 18.7 bushels of which consisted of tubers weighing more than two ounces each, and the remainder of tubers weighing between one and two ounces.

**Conclusions**

While no attempt has been made to draw definite conclusions from the data as to the relative number, quantity, or size of tubers to be expected from 6-inch and 15-inch plantings, certain general recommendations may be made as follows:

1. In the production of seed potatoes of varieties of the Rural group, planting in this State should be considerably closer than 15 by 36 inches as the net yield of the crop is thereby increased and tubers of a more desirable size obtained.

2. Seed potatoes designed for home use may be planted as close in the row as is consistent with roguing, altho it is probably impracticable to rogue properly plants set as close as six inches.

3. A crop to be sold either for seed or for table use may require somewhat thinner spacing in order to avoid the production of a large number of small tubers.

4. Potatoes grown on rich garden soil for table use may be planted as close as 6 by 30 inches to good advantage.