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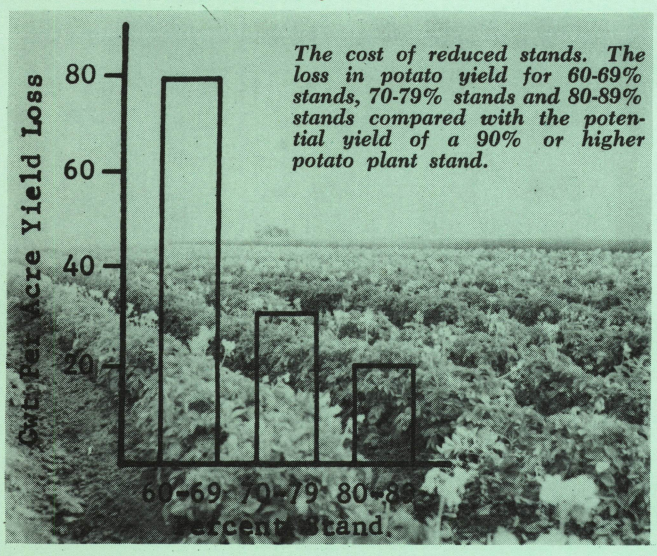
BETTER STANDS CAN BOOST POTATO PROFITS

Agricultural Extension Service
Agricultural Experiment Station
College of Agriculture ☆ University of Idaho

*By Richard E. Ohms**

Poor stands reduce Idaho potato yields each year. Only 27% of the potato acreage surveyed in a special study in eastern Idaho had stands of 90% or better in 1963. The remaining 73% of the acreage had poorer stands, lower yields and reduced income.

INCOME LOSS resulting from poor stands will vary from year to year. However, it is conservatively estimated *that improved stands could add $20 to $30 per acre to Idaho potato grower incomes in 1965.* The survey mentioned above showed that growers with plant stands of 90% or better harvested 20 cwt more U.S. No. 1 potatoes per acre than those with stand percentages from 80% to 90%. The reduction in yield for lower stand percentages is illustrated by the chart below.



The cost of reduced stands. The loss in potato yield for 60-69% stands, 70-79% stands and 80-89% stands compared with the potential yield of a 90% or higher potato plant stand.

*University of Idaho Extension Potato Specialist

CROP LOSS Looking at the loss caused by poor stand another way, the 1963 survey showed about *2-cwt drop in yield for each 1% reduction in stand.* Poor stands that year were estimated to have cut potato production 32.1 cwt per acre—more than a 370,000-cwt loss from the 11.5 thousand acres surveyed. Assuming the survey was representative of Idaho, the state lost nearly 8 million cwt in potato production in 1963 because of poor stands.

The yield reductions uncovered by the survey of potato growers are substantiated by data collected from University of Idaho experimental plots.

Effect of percent stand of potatoes on total and U.S. No. 1 yields in 1943 field plots

Percent Stand	Total Cwt per Acre	U.S. No. 1 Cwt per Acre
96	310	255
68	266	213
48	216	160
44	212	151

STAND AND TUBER QUALITY

Potato plants next to a missing hill or a blank in the row tend to increase their top growth. This top increase upsets the top to tuber ratio and an increase in knobby tubers can be expected.

The 1963 grower survey and field plot data both confirm that *yield loss where stands are poor is primarily due to a reduction in the number of U.S. No. 1 tubers.* In general total yield decreases at the same rate as the yield of U.S. No. 1 tubers decreases.

POTATO PLANT STAND can be expresssed in various ways—hill spacing, stems per hill and stems per square foot. Reduction in stand brought on by reduction in any of these three measures of stand has a similar depressing effect on yield of No. 1 potatoes. Stems per acre may be the best final reflection of plant spacing, stems per hill or stems per square foot.

STEMS PER HILL University of Idaho research demonstrated in 1945 at Aberdeen that as the number of stems per hill increased, the total yield and yield of U.S. No. 1's increased. *The yield of U.S. No. 1's was twice as much for the hills with four stems as that of the hills with one stem.*

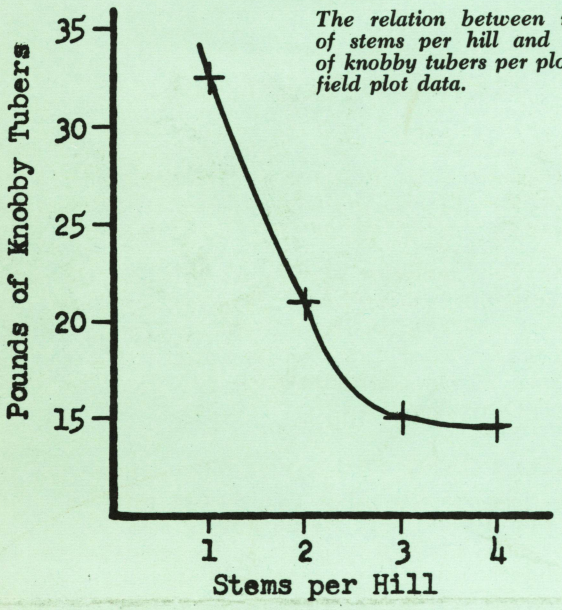
HILL SPACING In the same experiment, potatoes planted with 8, 12, 16 and 20 inches between hills had decreasing yields per plot as the drop spacing increased. These data showed that the highest yield was obtained at the 8-inch drop. The differences between the total yield and yield of U.S. No. 1 tubers in both experiments remained fairly constant regardless of the number of stems per hill or drop spacing.

Relation between number of stems per hill and yield

Stems/hill	Pounds/plot		Difference
	Total	U.S. No. 1	Total-U.S. No. 1
1	74.4	30.2	44.2
2	81.4	44.8	36.6
3	86.5	54.3	32.2
4	99.5	66.7	32.8

PLANTING RATE For 3 years; 1961, 1962 and 1963; the survey of eastern Idaho potato growers showed that the closer the spacing the higher was the total and U.S. No. 1 yields. This verified, under actual farming conditions, the experimentally noted effects of stand, of stems per hill and of hill spacing. It should be pointed out that as the planting rate increased the size of the tubers decreased. Thus, the *planting rate needs to be adjusted to the individual situation. The key to the proper spacing is the number of knobby tubers.*

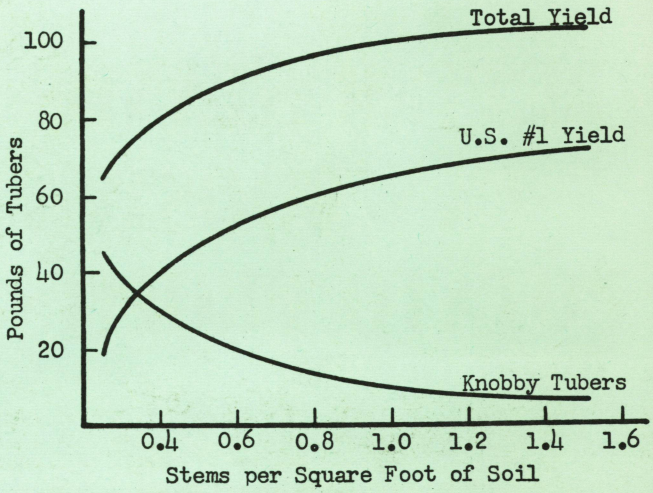
SPACING AND KNOBBY TUBERS The relation between the number of stems per hill and the pounds of knobby tubers per plot is shown below. *Three stems per hill controlled knobby tubers as well as four stems per hill.*



The relation between number of stems per hill and pounds of knobby tubers per plot, 1945 field plot data.

In 1945 field plots increasing the planting rate increased the plants per acre (stems per unit of soil). This affected the yield of knobby tubers. When the drop spacing increased, the amount of knobby tubers increased.

Perhaps the relation of stems per hill and planting rate should be expressed or thought of as stems per square foot of soil surface. When the above plot data is expressed as stems per square foot of soil surface, the *stems per unit of soil stopped being a limiting factor to yield when there were fewer than 10 percent knobby tubers.*



This chart summarizes the effect of plant stand reported as stems per square foot of soil surface to total yield and yield of No. 1 potatoes.

SUGGESTIONS FOR IMPROVED STAND

CERTIFIED SEED is the best starting point. Avoid seed that shows signs of bin heating or frost damage.

WARM UP SEED to start sprouts growing. Seed potatoes stored at 40° F temperatures should be warmed to 60° F or higher for 10 to 14 days before planting.

SEED PIECE should be generous. The 1½ to 2-ounce size will help insure strong, healthy hills with 3 to 4 stems each. The seed should be cut in a potato cellar where the humidity is high. Keep the doors closed as much as possible to avoid drafts.

PROTECT BEFORE PLANTING Protect from sun and wind. Cover trucks when hauling.

SOIL MOISTURE should be high enough to promote healing of the cut seed and encourage sprout development. If seed must be used in a dry seedbed, use a chemical seed treatment.

SOIL TEMPERATURE should be at least 45 to 50° F.

BEST SPACING will depend upon the individual situation. In eastern Idaho seed pieces spaced 9 inches apart in 38 inch rows produce well in fertile soils. Use your previous crop as a planting criteria. If more than 10% of your tubers were knobby try a closer spacing.

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James E. Kraus

JAMES E. KRAUS, *Director*

PO 779 7M—2-65