

AMPUTATION OF MOTHER TUBERS FROM RUSSET
BURBANK POTATOES AT INTERVALS AFTER PLANTING

by
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Many experiments have shown that the substances stored in the mother tubers are utilized by the sprout as soon as germination commences. The vigor of the sprout, the rate of growth and the final yield are related to the size of the seed piece at planting time.

Sikorski found that amputation of the mother tuber reduced yields at all stages studied. He also believed that the mother tuber had influence over yield during the complete vegetative growth of the plant.

Seliber also found that removal of the mother tuber reduced yield, but that variety of potato was important. He found that the varieties Reitan and Chugunka were influenced to a greater extent by amputating the mother tubers than were the varieties Kruger and Epicurez.

Bodlaender and Marinus also found that amputation of mother tubers had a greater effect on earlier varieties of potatoes.

F. E. Denny studied amputations of mother tubers on the varieties Irish Cobbler and Bliss Triumph. He grew potatoes in clay pots. Removed the potato plant from the pot to cut off the mother tuber and then set out the potato plant in a field plot to collect yield data. He found that early amputation of the mother tuber had greater effect on yield of tubers than upon the final size of the vine. Denny found that the mother tubers of Bliss Triumph were more subject to rot than those of Irish Cobbler and this influenced the final yield difference between amputation at 10 inches high and the control. He also reports that the Irish Cobbler plants make use of the mother tubers material to a later period of growth than does the Bliss Triumph. Mother tuber lost a high percent of solids but not weight. Sugars usually increased and starch decreased.

I could find no references concerning amputation of mother tubers from Russet Burbank potatoes. This study was initiated to see what differences, if any, occurred.

PROCEDURE

Three separate plantings were made in sandy loam soils so amputations would be easier. Two plantings were made on April 22nd, 1976 in southwestern Idaho at 2200 ft. elevation. The third planting was made on May 24th in central Idaho at 5000 ft. elevation. Ten mother tubers of approximately 2-1/2 ounces in size were planted in 10 ft. of row per plot. The treatments were replicated 4 times at each location. The mother tubers were amputated by locating them using a narrow trowel, and pulling the mother tubers from the plants. The tubers were frozen and analyzed for solid content, starch, protein, amino acids and sugars. Samples were replicated at planting time, and at each stage of amputation.

Mother tubers were amputated at 3 different stages of growth and they were the four leaf stage of growth, the 8 leaf stage of growth and the 1st bloom stage of growth.

The control was not disturbed.

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The resultant crop was harvested and yield for each treatment was recorded. Specific gravity of the resultant crop and fry color was determined by the J. R. Simplot Company.

RESULTS

Removing the mother tuber from the potato plants at the 4-leaf stage of growth seemed like a severe procedure. However, there was no known loss of potato plants. Water was applied within 12 hours of the removal of the potato seed piece at the 4-leaf stage of growth and helped the plants to survive. There was no significant difference in stem counts between plots at harvest time.

Potato yields were most suppressed by the seed piece removal at the 4-leaf stage of growth. Each subsequent amputation had its effect on yield and the differences are significant at the 5% level.

The yields were as follows:

4-leaf	390 cwt/acre
8-leaf	423 cwt/acre
1st bloom	429 cwt/acre
Control	445 cwt/acre

The mother tuber provided most of the nutrients to the developing potato plant prior to the 4-leaf stage of development. It also appears that the mother tuber is of value to the potato plant at all stages of growth.

A summary of average nutrients is as follows:

	Total Nutrients (% dry wt.)	% dry wt.	Total nutrients remaining (per 100gms fresh tissue)
Mother tuber	94	22	21g.
4-leaf	84	17	11g.
8-leaf	65	8	5g.
1st bloom	58	5	3g.

This data is similar to that which other workers had found on other varieties of potatoes.

There was no significant differences of specific gravity or fry color for any of the treatments.

This data and the data reported by other workers shows the value of the mother tuber to the subsequent yield of potatoes. When we inspect potato fields early in the year we encounter a great deal of seed piece rot, especially on cut seed. All our growers treat their seed but our present methods of cutting and fungicides used do not control seed piece rot as well as we would like to see. We need more research on control of seed piece rot to protect the mother tuber and thereby increase yields.