THE AMMONIUM THIOCYANATE TREATMENT FOR HASTENING THE SPROUTING OF DORMANT BLISS TRIUMPH POTATOES

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It has been recognized for several years (3) that it is necessary to treat potato seed pieces to hasten sprouting when dormant seed stocks are used for planting. In the Everglades area the seed stocks received from the north for early fall planting are dormant, as also are the home-ground stocks sometimes used to plant the spring crop. Denny (1) (2) was the first to develop successful chemical treatments which would force dormant potato seed pieces to sprout. Following his suggestions we (3) have adapted the ethylene chlorhydrin treatment to the needs of Everglades potato growers in experiments covering a period of 13 years. Denny (1) (2) also had forced sprouting of dormant tubers by soaking cut seed pieces in solutions of the sodium, potassium and ammonium thiocyanates. These treatments have not been regarded favorably, first, because the sodium and potassium thiocyanates have sometimes caused the seed pieces to rot, and secondly, because soaking for an hour is inconvenient for extensive operations.

Experiments were begun in 1942 to determine whether the ammonium thiocyanate treatment could be adapted to local needs. In that year it was learned that soaking freshly cut seed pieces in 1 and 1½ per cent solutions of ammonium thiocyanate for one hour was likely to cause the seed pieces to rot. Likewise, instant dipping of the seed pieces in 2, 2½ and 3 per cent solutions was injurious. It was found, however, that freshly cut seed pieces could be dipped safely in ½ and 1 per cent solutions of ammonium thiocyanate, and that the seed pieces would sprout earlier when so treated.

In 1943 it was found that the best results were obtained when ⅔ per cent or 1 per cent solutions of ammonium thiocyanate were used. It made little difference whether freshly cut or calloused seed pieces were treated. The stands and yields were better when the treated seed pieces were not planted immediately, but were allowed to stand for 18 to 20 hours. The percentage of seed pieces sprouted and the yield of tubers with this treatment compared favorably with the ethylene chlorhydrin treatment.

The experiments in 1944 confirmed the earlier work, and showed that although ammonium thiocyanate-treated seed pieces sprouted some-
what more slowly than did the ethylene chlorhydrin-treated seed pieces, the final stands and yields were equal to, or better than, those obtained by using ethylene chlorhydrin. Both treatments forced early sprouting, increased the final stand, hastened maturity and increased the yields.

Seven growers made field trials of the ammonium thiocyanate treatment in 1944. Each of the growers obtained better stands with this treatment than with the 1:75 ethylene chlorhydrin dip treatment. The yields on these plots were compared by four growers who found that they obtained, on the average, forty additional bushels per acre with the ammonium thiocyanate treatment.

The ammonium thiocyanate treatment is recommended to growers on the basis that it gives as good or better results than ethylene chlorhydrin; that it permits a more convenient schedule of operations; and that it is safer to use. Furthermore, it appears that potatoes grown with this treatment generally produce a cleaner crop than those grown from ethylene chlorhydrin-treated stock. This is apparently due to an effect on potato scab which is still being studied, and which will be reported in a later paper. The hot formaldehyde treatment for scab should not be omitted when this dormancy treatment is used.

The ammonium thiocyanate treatment as recommended is quite simple. The boxes of freshly cut seed pieces should be dipped for an instant in a solution containing 3 pounds of ammonium thiocyanate in 50 gallons of water. After dipping, the excess solution should be allowed to drain back into the tank and then the boxes may be stacked overnight. The treated seed should be planted the following day. As with the ethylene chlorhydrin treatment, it is best to treat late in the day to obtain the advantage of temperatures below 80° F. and to stack the boxes of treated seed so that they are protected from the sun, wind or rain,—but with some ventilation. An open packing shed platform is a suitable site for the operations involved.