with insect pollination would suffice provided isolation from other sweetpotatoes was maintained. Adequate control of parental representation could be obtained by bulking equal numbers of seed from each parent for the first generation.

In all generations following the initial crossing of parents, random breeding populations grown in isolation and insect-pollinated could be used. Although no critical information exists regarding population size, approximately 500 plants per generation should be sufficient where flowering was good. Equal numbers of seed from each plant would be bulked for the next generation. Selection for simply inherited characteristics should be avoided until after four or five generations of intermating, since such selection would tend to fix chromosome segments and thus reduce the frequency of effective recombination. This period would allow for breakup of the relatively long linkage blocks, and selection could then be imposed.

A number of alternatives are possible after formation of the random breeding base population (following the fourth generation). The base population could be allowed to continue in the original manner, and as many subpopulations as desired altered toward certain plant breeding goals by selection; or selection could be imposed on the base population itself.

While the random breeding base population was being developed, any favorable plant could be saved for additional testing. Remnant seed should be kept from each generation as a safeguard against subsequent seed production failures or loss of desirable traits by genetic drift. All additional seed could be grown and screened for horticultural value by conventional methods.

Advantages of the procedure are that it would utilize both intra- and inter-chromosomal recombinations, allow expression of new epistatic effects each generation, circumvent unintentional attempts to fix and transmit epistatic effects, provide an orderly improvement in parental types each year, entail no hand crossing, and require no detailed records. A disadvantage is the time required to establish a randomly interminating population. The kind and amount of selection for maximum genetic advance is an unsolved problem. Techniques of introducing new variability (disease resistance, for instance), without having to start an entire new population, need to be found. These problems can be solved and, therefore, should not detract from the usefulness of the proposed breeding procedure.

Hanson, W. D. Theoretical distribution of the initial linkage block lengths intact in the gametes of a population intermated for $n$ generations. Genetics 44:839–846. 1959.

IMPROVED TECHNIQUE USING CALCIUM PANTOTHENATE FOR HYPODERMIC INOCULATION

Wheat culms were hypodermically inoculated at the late jointing to early boot stage with ureidospores suspended in water and calcium pantothenate. One hundred plants of 'Early Blackhull' and 'Renacimiento' were made in 1961 with an isolate of race 29 of \textit{P. graminis tritici}. Early Blackhull was made in 1962 with a composite of 5 races (11, 15, 29, 38, and 56) due to time required for development of the disease. No attempt was made to have the same concentration of ureidospores for different varieties which were inoculated at different times. Pustules were counted after they were fully developed to insure that differences were not due to time required for development.

Results and Discussion

Urediospores suspended in $10^{-2}\text{M}$ calcium pantothenate resulted in a higher percentage of infections in \textit{P. graminis tritici} (Table 1) than did the water suspension on all varieties of wheat. Increases in percent of infected plants ranged from 7 to 150 (Table 1). The water suspension also resulted in a greater number of pustules per infected plant than did the water suspension on all varieties of wheat. Increases in percent of infected plants ranged from either the standpoint of pustules per infected plant. The infection type was not changed on any of the four varieties on which these results were obtained.

On the basis of the increased number of infections due to the influence of calcium pantothenate, this technique has been adopted by the authors. Whether the same technique would be successful with other rusts on other hosts has not been determined.