VARIATIONS IN YIELD OF PURE LINE GREEN MOUNTAIN POTATOES GROWN IN A CONTROLLED ENVIRONMENT

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It is commonly believed that selection does increase the yield of potatoes and that certain pure lines of a healthy stock are more productive than others, and field data are not lacking illustrating the benefits that accrue from selection. It would seem, therefore, that if one pure line of potato had inherently greater yielding capacity than another pure line of the same variety that this characteristic would be maintained unimpaired in succeeding generations were care taken to eliminate, in so far as possible, variations induced by the milieu.

An attempt has been made to submit this view to experimental verification in the case of the Green Mountain potato. Ten tubers between 50 and 70 grams in weight, selected at random from the seed plat bin of a certified seed grower, were bisected along the major axis, trimmed to weigh between 20 to 25 grams and planted in large pots containing equal amounts of air-dry soil carefully and thoroughly mixed to insure uniformity. Water was added to each pot in amount equal to 60% of saturation of the air-dry soil. The saturation point of the soil was determined for each pot separately, and all pots used in any one experiment at the working percentage of water used came within the maximum range of 4%.

One set of half tubers were grown at a mean temperature that varied slightly from year to year but lay within the limits 12.9° and 15.47°C. The other set of half tubers were grown at mean temperatures that ranged between 19.92° and 21.7°C. For convenience, we will speak of the former as being grown at 15°C and the latter at 20°C.

The plants were grown for approximately the same length of time each year timing from date of emergence to date of harvest. The seed was planted at the end of January or early in February, and the crops were harvested at the end of April or in May.

A number of experimental cultures have been grown under the same environment, or under conditions involving a change in environment from one generation to the next, for three or more generations, but since the data obtained are mutually supporting, it would be redundant to attempt to present it in full. We will present simply the data for those experiments which are most extensive and illustrate most fully the pertinent facts.

EXPERIMENTAL

YIELD INHERITANCE IN TUBER UNIT CULTURES

The data presented in Table 1 show the variations in yield met with over a period of three generations of the progeny of 10 tuber