THE EFFECT OF GREEN SPROUTING ON YIELD OF EARLY POTATOES

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Abstract

Three yield trials of early sizing potato seedlings and varieties were conducted at separate locations over a two-year period in New Brunswick, Canada. Two preplanting treatments of the seed were used: green sprouting for 3 weeks at 65 F (18 C) and check samples from storage at 45 F (7 C). Graded yield results and specific gravity determinations obtained 82 days after planting are presented. A highly significant increase (16-28%) in yield of marketable tubers was obtained from the green sprouted treatments. Higher specific gravities were recorded for 32 of the 43 green sprouted plots over the checks.

The practice of green sprouting seed for early potato production is a very old one in Europe, but of more recent origin in America. In Scotland, Whitehead et al. (1) observed that practical experience strongly favoured green sprouting seed tubers before planting and that the practice is being adopted by an ever increasing number of farmers. In a series of trials with four varieties over a two-year period they reported increased yields averaging 18% over those from nonsprouted tubers. The increase occurred mainly in the weight of marketable sized tubers. Cox (2) in England suggested that chitted (green sprouted) seed can result in harvest dates being advanced by one to two weeks, a period in which the price of earlies can drop by as much as 50%. In the U.S.A., Hardenburg (3) has shown that marketable yields per acre are significantly increased by green sprouting treatment. However, Chipman (4) in Nova Scotia in an experiment with tubers exposed to sunshine at a temperature of 66 to 72 F, darkness at 71 F and storage at 40 F found yields significantly higher at 84 days for the darkness treatment at 71 F but no significance between treatments when harvested at 91 days.

The aim of green sprouting is to produce a short sturdy sprout 1" to 1½" in length. Growth begins almost immediately such tubers are planted even when the soil temperature is rather low.

The objective of the present work was to investigate the effects of green sprouting on North American varieties and seedlings.

Materials and Methods

Three yield trials containing 14, 14 and 15 seedlings and varieties selected for their early sizing ability were grown at three locations in New Brunswick in 1969 and 1970, at McDonald’s Corner, Lower Jamseg and Benton.

The varieties Warba and Irish Cobbler were included in all trials, Fundy, Sable, Avon and La Rouge in the Benton trial, the remainder of the stocks were Fredericton-bred seedlings selected for their early sizing tendency.

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Previous to planting, the seed tubers of each seedling and variety were divided into two lots, one lot was kept in storage in darkness at a temperature of 45 F (7 C) and the other lot was green sprouted by putting the seed into trays one layer deep, and placing on shelves in a room with a temperature of 65 F (18 C) and where they were exposed to light of 19 foot candles from cool white fluorescent lights for a period of 3 weeks before planting.

Four replications of each treatment were alternated in the trials, which were planted on May 2nd in 1969 and April 29 and May 21st in 1970. Each replicate consisted of 25 sets of each seedling and variety spaced 10 inches between sets and 3 ft between rows. An 8-16-8 fertilizer was applied at the rate of 1700 lb per acre. Routine insect and disease control measures were carried out during the growing season. The trials at McDonald's Corner and Lower Jemseg were harvested 82 days after planting. The Benton trial was topkilled with parquat at 78 days and harvested 10 days later. The tubers were graded into Canada #1 size for earlies, 1¾", (473 cm) minimum size and small. Specific gravity determinations were made of all varieties.

**RESULTS**

In all trials, the yields of marketable tubers from the green sprouted seed exceeded yields grown from unsprouted seed (Tables 1, 2 and 3). The average increase for the 1969 trial was 28%. In the two trials conducted in 1970 the results were similar, the trial at Lower Jemseg also gave a 28% increase in marketable yield and the later planted Benton trial, a 16% increase. All the results were significant at the 1% level of probability.

An examination of tuber specific gravities from the two treatments showed that 12 of the 14 entries in the 1969 trial had significantly higher readings when grown from the green sprouted seed than from unsprouted seed. The results in 1970 were similar. At Lower Jemseg, 12 of the 14 and at Benton 8 out of 15 lots gave higher specific gravity readings from the green sprouted seed than from the unsprouted seed.

**DISCUSSION**

The results from this trial demonstrate the value of green sprouting as a means of increasing yields of early potatoes.

There are other advantages to green sprouting besides increased yield. In late seasons, planting may be delayed until soil conditions are favourable without making the crop unduly late. Rogue varieties can be identified easily by sprout color and conformation, and diseased tubers can be discarded before they are planted.

Probably one of the biggest disadvantages to its wider adaptation for large scale plantings is the necessity for providing buildings where large quantities of tubers can be green sprouted. Greenhouses have been used for this purpose as have many types of outbuildings. Recently in Europe there has been some development in the use of enclosed buildings provided with artificial strip lighting where better control of light and temperature can be obtained (2).