LENGTH OF DORMANCY AND SPROUTING CHARACTERISTICS OF TEN POTATO CULTIVARS

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Abstract

The length of dormancy and sprouting characteristics of ten cultivars (Bison, Kennebec, Norchip, Norgold Russet, Norland, Red Pontiac, Russet Burbank, Viking, Dakchip, and ND8891-3), were compared. Russet Burbank had the longest dormancy period and the slowest rate of sprouting after dormancy ended. Viking and Norgold Russet had the most sprouts and Kennebec the fewest. Dakchip had the shortest dormancy period, the greatest weight of sprouts and the greatest weight loss.

Dormancy was shortest in the warmest (20°C) storage. Storage at 2°C for six to nine weeks increased sprouting after dormancy ended compared with continuous 10 or 20°C storage.

Resumen

La duración de la dormancia y las características de brotamiento de 10 cultivares (Bison, Kennebec, Norchip, Norgold Russet, Norland, Red Pontiac, Russet Burbank, Viking, Dakchip y ND 8891-3) fueron comparados. Russet Burbank tuvo el período de dormancia más largo y la tasa más lenta de brotamiento luego del término de la dormancia.

Viking y Norgold Russet tuvieron el mayor número de brotes y Kennebec el menor. Dakchip tuvo el período de dormancia más corto, el mayor peso de brotes y la mayor pérdida de peso.

La dormancia fue más corta en el almacenaje bajo condiciones más cálidas (20°C).

Almacenaje a 2°C durante 6 a 9 semanas aumentó el brotamiento después del término de la dormancia, comparado a almacenaje continuo a 10 o 20°C.

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Introduction

Dormancy affects the planting of northern grown seed in Southern States and the timing and need of sprout inhibition of potatoes used for other purposes. The duration of dormancy varies between years, among cultivars, and depends on temperature and humidity during storage. The difference in the dormancy period between years is small compared to that between cultivars (3,6). The length of dormancy in 51 cultivars grown in Sweden stored at 20°C and 85% R.H. ranged from 5 to 19.5 weeks (3). Dormancy in 35 American cultivars stored at 21°C and 85% R.H. ranged from 5 to 9 weeks, with these same cultivars remaining dormant from 7 to over 41 weeks at 10°C and 85% R.H. (8). A moist compared to a dry storage environment has shortened dormancy from more than seven weeks to less than seven days (4). Several extensive reviews on factors affecting dormancy in the potato have been published (1,2,3).

This study was initiated to determine the dormant period and sprouting characteristics under various storage temperatures of potato cultivars grown in the Red River Valley.

Materials and Methods

Nine cultivars and one advanced breeding line were planted May 17 at the Potato Research Farm near Grand Forks, North Dakota. Tubers were lifted on October 11 after vines had reached maturity. After harvest tubers were stored at room temperature for four days and at 5-6°C for the next two weeks.

Storage treatments in controlled temperature rooms were initiated on November 1, 1978. Each treatment consisted of ten tubers per cultivar and was replicated four times. Tubers selected from each cultivar averaged as follows: Bison 143 g, Kennebec 297 g, Norchip 138 g, Norgold Russet 163 g, Norland 145 g, Red Pontiac 248 g, Russet Burbank 139 g, Viking 276 g, Dakchip 161 g and ND8891-3 176 g. The difference in tuber size was largely due to the inherent differences in tuber size between the various cultivars. This variability did not occur between treatments where the mean tuber size only ranged from 186 to 195 g. Following selection, tubers were washed, weighed, put into wooden flats and placed in rooms at 2, 10 or 20°C. and held at a relative humidity 95 ± 2%.

Tubers were held initially at 2°C to determine the effect of various periods of low temperature on dormancy and subsequent sprouting at 20°C. Temperatures of 10 and 20°C were used to compare the length of dormancy and sprouting at two temperatures or temperature combinations favorable to sprouting. After three, six and nine weeks at 2°C and after three and six weeks at 10°C, the dormant tubers held at these temperatures were moved to 20°C to promote sprouting.