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Short Communication

Breaking of Dormancy in Potato Tubers by Electrical Current

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Summary

The effects of electrical current in breaking of dormancy of potato (*Solanum tuberosum* L.) tubers were investigated with continuous and repetitive currents. Then, in the case of repetitive current, dormancy was seen to be broken at potential differences of 50 and 100 volts. Five days after current application, sprouts started to appear on the tubers.

Key words: Breaking of dormancy, Solanum tuberosum, electrical current, sprout length.

Introduction

When the buds of potato tubers are unable to grow at favorable temperatures, they are considered to be dormant (Coleman, 1987). The dormancy period of potato tuber is approximately two months or more after harvest (Cho et al., 1983).

The development of a consistent dormancy breaking method to allow the immediate use of this material for field or greenhouse production would have immediate time saving and subsequent economic benefits (Coleman and Coleman, 1986). In addition, dormancy breaking of seed tubers is important for incorporation into seed multiplication programs and rapid post-harvest disease testing procedures (Coleman, 1983).

So far, some chemicals have been used to break dormancy of the tuber. Gibberellic acid and rindite (three component mixture containing ethylene chlorohydrine, ethylene dichloride and carbon tetrachloride) have received considerable attention as routine dormancy breaking agents (Mioduszewska and Bielinska-Czarnecka, 1984; Clegg and Rappaport, 1970; McDonald and Coleman, 1984). Cytokinins are capable of breaking tuber dormancy as well (Hemberg, 1970) and bromoethane has been evaluated as a suitable chemical for breaking tuber dormancy (Coleman, 1983).

In this study, the effect of electrical current application at different voltages in continuous and repetitive manners to break dormancy of the potato tubers were investigated. The results of these effects were shown measuring the sprout lengths of the tubers.

Materials and Methods

Potato tubers (*Solanum tuberosum* L.) of the Agria and Famosa cultivars were obtained from «Erzurum Agricultural Research Institute» 20 days after harvest. Electrical current was applied by inserting two needles into the opposite ends of the tuber, which were connected to an electrical stimulator (HSE Trapezoidal Rightangular Impulse Stimulator). Potential differences of 10, 50 and 100 volts were applied as a direct current in two ways:

i) continuously for a period of one minute, and
ii) repetitively with a 60 Hz repetition for one minute (each impulse with 10 msec duration). The voltages were selected arbitrarily. Control tubers were treated only by inserting needles. Each application was carried out on 8 tubers. After the treatment procedure, the tubers were immediately left in an incubator at 20 °C temperature with 60% humidity. The degree of tuber sprouting was followed for two weeks after the current application and the lengths of the sprouts were measured at intervals of two days. The analysis of variance method was applied to the data (Steel and Torrie, 1980).

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