Title Bromoethane induces dormancy breakage and metabolic changes in tubers derived from true potato seed

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Abstract

Bromoethane breaks the dormancy of potato tubers thus enabling early planting after harvest. Because of the increasing importance of true potato seed (TPS) for potato propagation in tropical and subtropical regions, we examined the efficacy of bromoethane on the dormancy breakage of mini-tubers grown from TPS, as well as the physiological changes induced. Bromoethane treatment of mini-tubers induced a rapid increase in respiration and ethylene production, which subsequently declined. Bromoethane stimulated the rate of sprouting and increased tuber weight loss. There was also a transient increase in the sucrose and glucose concentration in the tissues near the buds and in the parenchyma of bromoethane-treated tubers, whereas a transient increase in fructose was observed only in the tissues near the buds. Of the enzymes studied, invertase (acid and alkaline), fructokinase and glucose 6 phosphate dehydrogenase showed no change in activity following bromoethane treatment. However, hexokinase, UGPase and AGPase were more active in bromoethane-treated tubers than in the corresponding controls, while α-glucosidase showed a higher level of activity in bromoethane treated tubers, especially 2 d after treatment. It is concluded that bromoethane induces dormancy breakage in potato mini-tubers, partly through the exertion of stress, and significant metabolic changes within the tubers may be detected before the visible onset of sprouting.