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## Plant Production Science

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### Accumulation of Soluble Sugar in True Seeds by Priming of Sugar Beet Seeds and the Effects of Priming on Growth and Yield of Drilled Plants

[Yuji Mukasa](#)<sup>1)</sup>, [Hiroyuki Takahashi](#)<sup>1)</sup>, [Kazunori Taguchi](#)<sup>1)</sup>, [Naoki Ogata](#)<sup>1)</sup>, [Kazuyuki Okazaki](#)<sup>1)</sup> and [Masakatsu Tanaka](#)<sup>1)</sup>

1) National Agricultural Research Center for Hokkaido Region, National Agricultural Research Organization

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**Abstract:** For improving the yield of drilled sugar beet (*Beta vulgaris* L. ssp. *vulgaris*), it is important to promote germination and early growth. In this study, the priming of sugar beet seeds was examined in six cultivars to improve their germinability in cool conditions. The optimum water content of sugar beet seeds (which botanically are fruits) during priming was 24 to 25% when they were kept at 20°C for 5 d. In further experiments, after the water content of seeds was adjusted to 24% by adding distilled water, the primed seeds were air-dried to below their original water content. The primed true seeds contained 0.5 to 4% more soluble sugar, by dry weight, than the control true seeds. The levels of amylase activity of the primed true seeds were 1.9 to 11.5 times higher than those of the control true seeds, though there was little change in  $\alpha$ -glucosidase activity. Priming shortened the average germination period at 8°C by 1.6 to 4.0 d and seedlings from the primed seeds emerged significantly faster than did seedlings from the control seeds in the field. The advanced emergence in the primed seeds brought about a significant increase in early growth compared with control seeds, and the root yield from the primed seeds tended to exceed that from the control seeds by 3% on average at harvest time. Priming did not affect the sugar, potassium, sodium or amino nitrogen content in the root.

**Keywords:** [Amylase activity](#), [Early growth](#), [Germination](#), [Priming](#), [Root yield](#), [Soluble sugar](#), [Sugar beet](#), [True seed](#)

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