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Differences in Vegetative Growth Response to Soil Flooding between Common and Tartary Buckwheat

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Abstract: Common buckwheat (*Fagopyrum esculentum* Moench cv. Shinano No.1) and Tartary buckwheat (*F. tataricum* (L.) Gaertn. cv. Nepal) were grown in pots to examine their responses to soil flooding. Flooding treatment was carried out during the early growth stage by completely submerging the pots in a nutrient solution from 12 to 36 days after sowing. The plant growth rate, relative growth rate and mean leaf area under the flooding treatment were reduced to 72, 90 and 83% of the control, respectively, in Shinano No.1, and to 29, 71 and 45% of the control, respectively, in Nepal. The excess moisture stress had no effect on the net assimilation rate (NAR) in Shinano No.1, but lowered the NAR to 68% of that in the control in Nepal. Excess moisture stress decreased the total leaf area to 76 and 34% of the control in Shinano No.1 and Nepal, respectively. Leaf growth rate, number of leaves and leaf area per leaf, which influenced the total leaf area, were reduced by the excess soil moisture. The relative water content of leaves was unchanged in Shinano No.1, but was decreased in Nepal. Reduction in bleeding from the cut end of stem due to flooding was greater in Nepal than in Shinano No.1. Excess moisture stress reduced the K^+ concentration of the stem and increased the Na^+ concentration of leaves, stem and roots more strongly in Nepal than in Shinano No.1. Development of adventitious roots in the surface layer of the nutrient solution was better in Shinano No.1 than in Nepal. In conclusion, Shinano No.1 (common buckwheat) had a stronger tolerance to excess soil moisture than Nepal (Tartary buckwheat). In Shinano No. 1, leaf growth and photosynthetic rate were not markedly affected and the capacity of absorbing water and nutrients was retained by developing adventitious roots in the solution above the surface of

the soil keeping proper physiological activity under excess moisture conditions.

Keywords: [Adventitious root](#), [Common buckwheat](#), [Flooding](#), [Interspecific difference](#), [Tartary buckwheat](#), [Vegetative growth](#)

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