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Effect of Charcoal on Germination and Early Growth of Barley Sprouts

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Abstract:

The aim of this study was to evaluate the effect of charcoal on germination and early growth of barley sprouts. Five treatments were employed based on different amount and treatment method along with control. Barley seeds were soaked in water for 8 hours. Two types of topping treatment were applied such as, charcoal: 100 g (designated as T1) and charcoal: 200 g (T2). Three kinds of mixing treatment were as follows: barley seeds were mixed with 100g of charcoal (designated as M1), with 200g of charcoal (M2), and with 300g of charcoal(M3). The control did not have any charcoal. In our finding, germination rates were observed 53.3% (control), 26.3%(T1), 36.3%(T2), 67.3%(M1), 81.7%(M2), and 79.7%(M3) at three days after inoculation (DAI). Length of radicle was found at 0.90 cm (control), 0.88 cm (T1), 0.99 cm (T2), 1.03cm (M1), 1.66 cm (M2), and 0.70 cm (M3) in 3 DAI. In addition, sprout length was found 4.5 cm (control), 10.4 cm (T1), 11.9 cm (T2), 5.7 cm (M1), 6.3 cm (M2), and 2.1 cm (M3) in 14 DAI. Fresh weight of sprouts were 0.78g (control), 1.03g (T1), 1.07g (T2), 0.96g (M1), 1.07g (M2), and 0.95g (M3). Among the treatment, topping of seeds on 200g of charcoal (T2) showed longest sprout length and fresh weight.

Mixing treatments showed higher germination rates and sprout fresh weight. The results may be attributed to difference in micro-climate conditions (mostly temperature and humidity) in the growth boxes in different treatments.

Key Words: Barley sprouts, charcoal, germination rate, sprout length, sprout fresh weight