

MITIGATION OF ARSENIC STRESS IN LENTIL VARIETIES BY APPLICATION OF COWDUNG

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Executive Summary

The soils of most of the district in Bangladesh are highly polluted with arsenic. The presence of high arsenic content in soil has led to its accumulation in crops, which has resulted in its collection at the concentration beyond the food safety threshold. Lentil (*Lens culinaris* L.) is one of the major pulse crops of the world and a principal source of protein in the human diet. Although it ranks second considering area and production, its consumer preference is the highest in Bangladesh. People of as affected areas as well as of the whole country are consuming as contaminated lentil as it is mostly cultivated in that areas and creating serious problem for human health. Cowdung is reported to as an agent to detoxify arsenate (As_V) to arsenite (As_{III}). Therefore, this project was initiated to evaluate the effect of cowdung on reducing as accumulation in lentil grain and increasing lentil yield. To achieve these objectives a pot experiment was conducted during October 2018 to March 2019 in the stress research rain shelter of Department of Agronomy, Sher-e- Bangla Agricultural University to study the mitigation of arsenic stress in two lentil varieties (BARI masur 2 and BARI masur 7) through cowdung application. Three level arsenic stress (0 ppm, 50 ppm and 100 ppm soil based) was imposed in pots and three levels of cowdung (0 t ha^{-1} , 5 t ha^{-1} and 10 t ha^{-1}) were applied in the pots where two varieties of lentil were sown. The results indicated that increasing as level in soil decreased seed yield plant^{-1} and increased seed arsenic content in lentil. Application of cowdung up to 10 t ha^{-1} mitigated negative effects of As in all the arsenic level in both the lentil varieties. It was also observed that although BARI masur 2 accumulated higher amount of arsenic in seeds compared to BARI masur 7, the relative seed arsenic content was higher in BARI masur 7, which indicated that BARI masur 7 is comparatively safe for consumption but BARI masur 2 is comparatively tolerant to as its relative seed as content is lower and thereby can be used in breeding to develop more As tolerant high yielding lentil varieties.

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