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Editorial

Enhancing Quality Seed Production of Berseem Clover (*Trifolium alexandrinum* L.) with Appropriate Irrigation Frequency and Plant Bio-regulators Spray

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Summary

Seed productivity and quality of Berseem clover, especially in the areas with heat stress during its flowering and fruit setting depend on several factors: date of sowing, irrigation management, other cultivation practices such as application of plant bio-regulators. In western Terai of Nepal, farmers are struggling with poor seed setting, lower seed yield, and inferior seed quality of Berseem clover. We conducted experiments at the Regional Agricultural Research Station (RARS), Khajura, Banke of Nepal to evaluate effects of date of sowing, irrigation applications, and sprays of plant bio-regulators. Findings revealed that November 10 was the best sowing date compared to November 25 as reflected by seed yield (0.809 versus 0.678 t ha^{-1}), herbage biomass (8.32 versus 5.95 t ha^{-1}), harvest index and seed components without altering the seed quality. The transition period between warm humid long day and cool dry short-day seasons is more crucial for the date of sowing and vice-versa weather transition for turning the vegetative to reproductive phases of the legumes. They are more sensitive to day length in which short days and stress often control flowering. The climatic requirements of the seed crops such as temperature, relative humidity, wind movement, sunshine hours are more critical during the reproductive phases.

The second-year experiments had four levels of irrigation frequency (single, twice, three- and four-times irrigations @ 666.67 kiloliters of water ha^{-1} at 15 days intervals after taking one cutting at 60 days after sowing) and three levels of sprays of plant bio-regulators (single, twice and three times foliar sprays of P_2O_5 @ 2 kg ha^{-1} + KNO_3 @ 4 kg ha^{-1} at 7 days interval in pre-flowering stage) both at the station (RARS, Khajura, Banke) and on-farm (Mainapokhar, Bardiya). The results revealed that three- or four-times irrigations had better seed yield.

The plant bio-regulators were applied directly through foliar spray to the plant during pre-flowering stages that could have more contribution to alter the life processes, and to improve seed yield. Moreover, factors contributing low seed setting of Berseem clover could be pollen sterility and post fertilization abortion of developing seeds due to high temperature. The drastic reduction in seed yield occurs primarily due to the reduced pollen viability under this high temperature and low humidity conditions. These phenomena, may be one or many, might be the reasons for the lower seed yield.

In overall it could be argued that November 10 would be an appropriate date of sowing compared to November 25; three times irrigations @ 666.67 kiloliters of water ha^{-1} at 15 days intervals after taking one cutting at 60 DAS, and three times foliar sprays of plant bio-regulators (P_2O_5 @ 2 kg ha^{-1} + KNO_3 @ 4 kg ha^{-1}) at 7 days interval in pre-flowering stage would combinedly enhance herbage biomass as well as seed yield of Berseem clover for the context resemble to hot and humid tropical, including to that of Western Nepal.

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