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Moth Bean: From Major to Dwindling Legume

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SUMMARY

Moth bean, once a paramount legume of the arid zone believed to be the most drought hardy crop, useful for desertification control and climate resilience owing to its adaptability to arid climatic conditions, biological nitrogen fixation, amenability to fit in mixed or sole cropping systems, is besieged to compete with other kharif pulses. This lifeline crop for arid farmers is dwindling in recent years in context of total area sown under this crop. Though, there are several constraints including biological and socio-economic policies behind this horror shift in acreage yet there is ample scope of improvement in moth bean in terms of plant breeding which can be useful in prevention of this crop from being an endangered crop.

INTRODUCTION

Moth bean, [*Vigna aconitifolia* (Jacq.) Maréchal; 2 n=22], a member of family Fabaceae, is generally thought to be suitable as a crop in tropical arid lands owing to its highest tolerance against drought and heat stress in comparison with other species of subgenus *Ceratotropis* (Somta et al. 2018). Its adaptive genetic makeup including deep root system, medium to short life cycle, extensive canopy, trailing growth habits and integral buffering capacity towards changing or unstable climatic circumstances in arid zone, make it as a sustainable in context of economy and expedient annual legume. In the insightful mixed cropping systems, moth bean is selected as one of the component crops with pearl millet (Kandpal et al. 2009). It becomes an imperative tool of resource-poor arid agriculture where drought and high temperature is common and natural phenomenon especially for sand-dunes, plain lands and degraded lands.

Despite this usefulness, the total area sown of this crop in arid zone or in particularly Rajasthan state, where this crop is mostly sown, is declining every year (Figure 1).

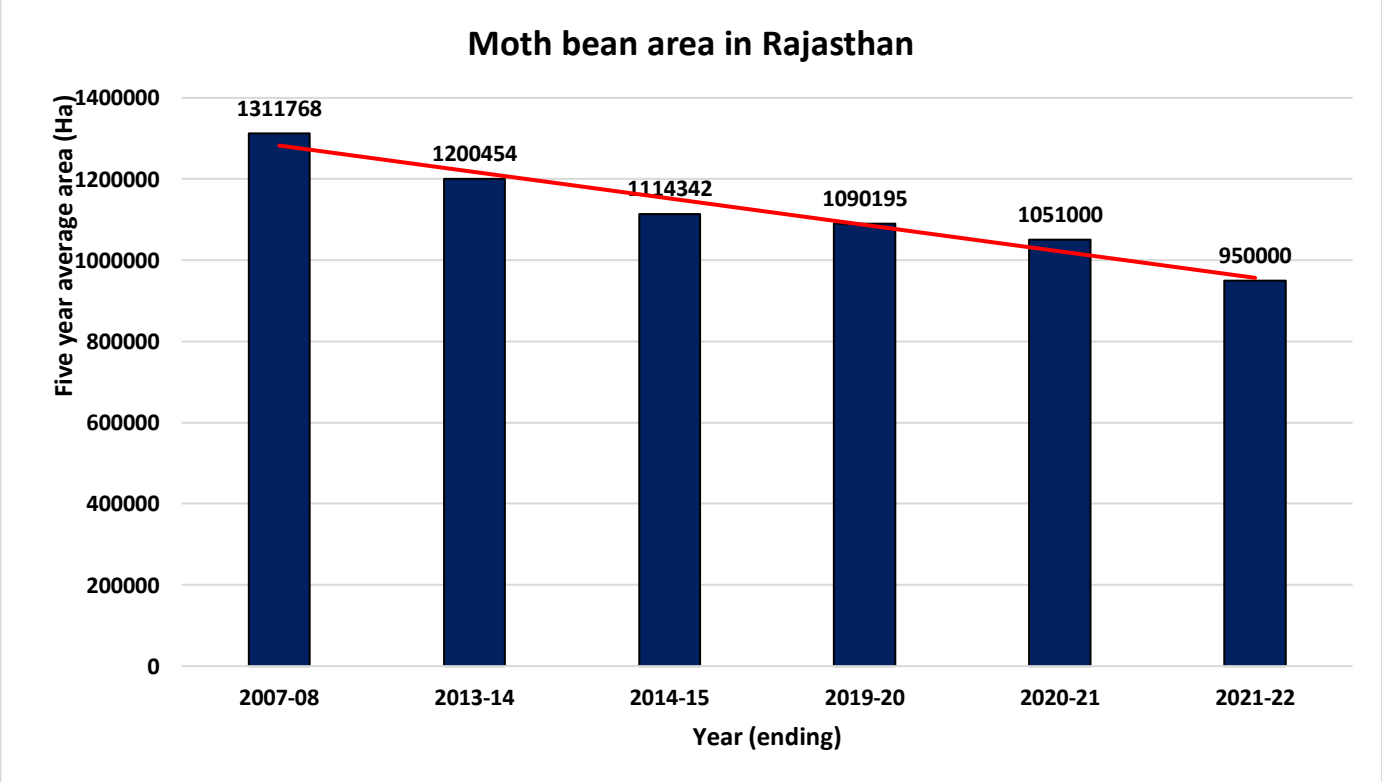

Figure 1: Trend of area sown in Rajasthan under moth bean crop

There may be several trends behind this epic decline in a major legume including biological and socio economic constraints.

Constraints

Like some other kharif pulses, moth bean generally grown under rainfed conditions prevailing marginal lands owing to its adaptation towards these areas. In due course of time, this adaption is became detrimental to its productivity barrier breaking ability. In the adaptation process, occurring of greater accumulation of genes conferring greater flexibility and thus adaptability to harsher environments rather than suitability to specific environments. The so-called selection pressure under subsistence agriculture was somewhat responsible for erosion or dilution of genes for high yielding genes in such crops. (Sharma et al. 2021)

Biotic constraints

In moth bean, most of the varieties evolved and released for cultivation are selections from the landraces which are adapted to conditions of intercropping under low fertility and poor management. Inherent yield potential of such varieties is low. Unless new varieties with high yield potential are developed, the cultivation is shifted to more productive areas and unless better package of practices are evolved, desired yield levels shall not be attained. Hence, Lack of improved and desirable genotypes, conservation and utilization of genetic resources, low harvest index, production and distribution of quality seed, incidence of pests and diseases and poor agronomic practices are the major technological constraints to moth bean production (Mahla and Sharma 2022)**.**

Socio-economic constraints

Owing to its limited share in total food grain production, moth bean along with other pulses are often labelled as secondary crop. Being restricted commercially and geographically due to lack of revolutionary technology, pulses have failed to generate enough enthusiasm and support for their development both by farmers and developmental agencies. Another aspect is the price support for this crop is lagged behind for farmers indicating its declining affection with farmers.

Scopes

Research Programmes

Factors focussed breeding efforts for the below factors,

- Upright plant type
- Photo and Thermo Insensitivity
- Determinate growth habit
- Synchronous maturity
- Compact/ semi erect growth habit
- Non-shattering of pods
- Resistance to biotic and abiotic stress may help stabilize yields and increase adaptation of new genotypes to different environments.

Large Scale Monitoring Programmes

The developmental and promotional factors focussed may be

- Sound seed distribution
- Industrial growth (moth bean products)
- Accelerated support price

In context of socio-economic constraints, a separate mission should be set up for developmental and promotional activities of pulses including moth bean and all the activities starting from seed distribution to procurement at support price should be monitored by it.

CONCLUSION

Moth bean, an imperative pulse of arid zone of India, losing its area in recent years due to several dynamics. Hence, it is very challenging to make sincere efforts at each and every front, exclusively for improvement and development of new moth bean varieties, adapted for this changing climate, bold and attracted seed quality as well as high nutritive values as compared to previous released can make this crop again the major pulse of marginal lands further may contribute substantially to our food grain production.

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