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## STUDY ON CROP LOSS ASSESSMENT OF BEETLE, *LEMA DOWNESI* Baly ON SHATAVARI (*ASPARAGUS RACEMOSUS*) WILD

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### ABSTRACT

An experiment entitled “Studies on crop loss assessment of beetle, *Lema downesi* Baly on Shatavari, *Asparagus racemosus* Wild.” was conducted at All India Co-ordinated Research Project on Medicinal, Aromatic plant and Betelvine project, Mahatma Phule Krishi Vidyapeeth, Rahuri, Dist.: Ahmednagar (Maharashtra) during *Rabi* 2023. During the course of study, the crop loss assessment was studied with treated and untreated control plots with Paired plot design owing to beetle, *Lema downesi* Baly on Shatavari with ten replications. The observations on dry root yield, the significant difference in dry root yield was obtained from the protected and unprotected plots. The average dry root yield in protected and unprotected plot was 19.76 q/ha and 14.01 q/ha, respectively. Consequently, the avoidable yield loss in Shatavari, *Asparagus racemosus* Wild due to beetle, *Lema downesi* Baly recorded 29.07 per cent dry root yield.

**Keywords:** Dry root yield, Yield loss, Shatavari, *Lema downesi*.

### Introduction

*Asparagus racemosus* Wild is an important medicinal plant which is regarded as a ‘Rasayana’ which means plant promoting general well-being by increasing cellular vitality and resistance. Use of *Asparagus racemosus* Wild is mentioned in the ancient literature of Ayurveda (Charaka Samhita). Traditionally, *Asparagus racemosus* Wild is indicated in epilepsy, Vata disorder, brain tonic, help in regulating cardiac disorder and hypertension. It is extensively used in male genital disfunctions, oligospermia, spermatogenic, irregularities and other male disorder such as painful micturition. In female, prescribed by the doctors in habitual abortions, weakness of the uterus, excessive bleeding during

menstruation (Thorne, 2000).

The chrysomelid beetle, *Lema downsei* Baly is reported to infest *Asparagus racemosus* Wild. The occurrence of this beetle was noticed on *Asparagus racemosus* Wild in the herbal garden of the Directorate of Medicinal and Aromatic Plants Research at Boriavi, Anand, Gujarat, India the infestation was noticed in February 2009, during regular surveys for insect pests on medicinal plants. Both the adults and grubs were found chewing the tender tips of new shoots and tender foliage which resulted in shallow holes on the shoot and brownish discolouration of the tissues. The affected tender shoots ultimately dried out. On an average 10-12 grubs and 5-6 adults per shoot were recorded whenever there were new shoots. The adults

were active throughout the year. They chewed on the foliage in the absence of tender new shoots, causing drying of leaves. Heavy infestation could weaken the plants and reduce the plant's root yield. Other pests reported on *Asparagus racemosus* Wild are shoot borer and aphids, but no major damage is observed (Gupta, 2017). First report of the Beetle, *Lema downsei* Baly on *A. racemosus* from India (Vipin and Saravanan, 2009).

### Material and Methods

To estimate the losses due to beetle, an experiment was laid out in paired plot design as suggested by Leclerg, E.L. (1971). There were only two treatments *viz.* protected and unprotected with 10 replications, recommended agronomic practices and interculture operations were adopted to the plot. The protected plot was kept free from beetle infestation by giving two sprayings of spinosad 45 SC @ 0.4 ml/L water with 15 days interval. The unprotected plot was exposed to natural beetle infestation. Finally, at the time of harvesting, dry root yield was recorded from each replication of the protected and unprotected plot.

### Results and Discussion

The data on monetary losses caused by beetle is decisive for implementing control strategies. With a paired plot design and treatment of Spinosad 45 SC @ 0.4 ml/L water, this field experiment was ventured for assessing the avoidable yield losses owing to beetle, *Lema downesi* Baly on Shatavari, *Asparagus racemosus* Wild.

Table 1 shows the significant differences between dry root yield/ha in the protected and unprotected plots. The relative data on root yield revealed that the beetle was responsible for reducing dry root yield considerably. Therefore, the significant difference in dry root yield was obtained from the protected and unprotected plots. The average dry root yield in protected and unprotected plot was 19.76 q/ha and 14.01 q/ha, respectively. Consequently, the actual amount of avoidable quantitative yield loss calculated on the basis of difference in the yield of roots obtained under protected and unprotected plot was 29.05 per cent.

**Table 1:** Effect of different treatments on beetle, *Lema downesi* Baly in assessment of avoidable yield loss in Shatavari, *Asparagus racemosus* Wild.

| Dry root yield (q/ha) |           | Loss (%) |
|-----------------------|-----------|----------|
| Treated               | Untreated |          |
| 19.82                 | 14.06     | 29.06    |
| 19.96                 | 14.16     | 29.05    |
| 18.76                 | 13.31     | 29.05    |
| 20.56                 | 14.58     | 29.08    |
| 17.98                 | 12.75     | 29.08    |
| 21.08                 | 14.95     | 29.07    |
| 17.77                 | 12.60     | 29.09    |
| 20.59                 | 14.60     | 29.09    |
| 19.88                 | 14.10     | 29.07    |
| 21.20                 | 15.01     | 29.05    |
| Mean = 19.76          | 14.01     | 29.07    |
| <b>Tcal -12.17</b>    |           |          |

't' Table (0.05) = 2.262 and (0.01) = 3.250

a = 't' table for paired comparison revealed very significant differences from the untreated control.

### Conclusion

On the basis of results obtained during the course of present investigation, it could be concluded that- The avoidable yield loss in Shatavari, *Asparagus racemosus*

Wild due to beetle, *Lema downesi* Baly recorded 29.07 per cent dry root yield.



**Plate 1 :** Beetle, *Lema downesi* (Baly) infestation on young vines of Shatavari, *Asparagus racemosus* (Wild)



Plate 2 : Treated and Untreated plots

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