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POD YIELD OF WINGED BEAN AFTER CHEMICAL TREATMENT FOR *CHOANEPHORA* BLIGHT DISEASE

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Abstract: Of 12 winged bean accessions tested, SLS 40 gave the highest pod yield followed by TPT 1, UPS 45 and UPS 99. Application of triademenol, vinclozolin and bitertanol to control *Choanephora* blight increased pod yields. Triademenol was found to be more effective when compared with vinclozolin and bitertanol.

1. Introduction

Winged bean (*Psophocarpus tetragonolobus* (L.) DC) has been recently recognized as a high protein crop for the tropics.[1] Pods are the preferred edible portion of the plant in Sri Lanka. Blighting of flowers, which in turn reduces the number of pods, has been observed in Sarawak,[8] Papua New Guinea[7] and Sri Lanka.[2] The causative fungus responsible for the flower (*Choanephora*) blight disease was found to be *Choanephora cucurbitarum* (Berk. & Rav.) Thaxter.[3]

Three systemic fungicides – triademenol, vinclozolin. and bitertanol were found to reduce spore germination and mycelial growth of *Choanephora cucurbitarum* and monthly application of these fungicides under field conditions reduced the *Choanephora* blight of winged bean flowers.[4] This paper reports on the pod yield of 12 winged bean accessions after monthly treatment with the above systemic fungicides under field conditions.

2. Materials and Methods

Twelve winged bean accessions of Sri Lankan, Papua New Guinea, Thailand, Indonesian and Nigerian origin (Table 1) were used in a field trial at the University of Kelaniya during 1986. The trial was a randomised block design with four replicates and a plot size of 1.5 x 4.5 m with a 2 m spacing from each other. Each plot consisted of 2 alternate rows, each with 4 plants at a spacing of 1 m within and between rows. From each plot 2 plants were randomly selected for spraying with each of the three systemic fungicides constituting a total of 6 plants and the remaining 2 plants constituted the controls. The systemic fungicides used were triademenol (Bayfidan), vinclozolin (Ronilan) and bitertanol (Baycor). Sowing, fertilizer application and the method, rate and frequency of fungicide application were as described by Gunasekera *et al.*[4] Pods were harvested three times during the trial which lasted 3 months and total pod fresh weights determined.

3. Results and Discussion

Generally in all winged bean accessions tested, blight levels of fungicide–treated plants were found to be lower than those of control plants, which agree with findings of Gunasekera *et al.*[4]

Pod yields of all accessions are well within the range reported by Mamicpic and Movillon.[6] Among untreated control plants the highest pod yield of 6.4 x 10^3 kg ha^{-1} was recorded from SLS 40 (Table 1). High pod yields ranging from 3.8 to 4.3 x 10^3 kg ha^{-1} were also recorded from untreated control plants of SLS 7, TPT 1, UPS 45 and UPS 99 (Table 1). These high yields while agreeing with the results of Gunasekera *et al.*[5] were significantly (P = 0.01) higher than those of SLS 100, UPS 66 LBNC 33p and Thailand 25–01 which range from 1.1 to 2.5 x 10^3 kg ha^{-1}. Pod yields of accessions treated with triademenol and bitertanol were significantly

Table 1: Effect of triademenol, vinclozolin and bitertanol on pod yield (x10^3 kg ha^{-1}) of 12 winged bean accessions from a field trial at University of Kelaniya

Treatment	Controls	Sprayed with			LSD
Accession		triademenol	vinclozolin	bitertanol	P = 0.01
SLS 40	6.4	7.0	6.5	6.8	0.2
SLS 7	4.3	8.2	7.2	6.9	0.3
TPT 1	4.2	6.8	4.9	4.5	0.2
UPS 45	4.1	3.2	3.3	3.7	0.5
UPS 99	3.8	4.7	4.0	5.2	0.2
UPS 122	3.5	4.8	3.0	4.6	0.2
SLS 11	2.9	5.0	4.0	4.4	0.2
Thailand	2.9	4.1	3.8	3.6	0.3
SLS 100	2.5	3.2	2.2	2.8	0.2
UPS 66	1.6	2.2	2.1	2.4	0.1
LBNC 33p	1.3	2.2	1.8	2.1	0.2
Thailand 25–01	1.0	1.5	1.2	1.5	0.2
	LSD P = 0.01	0.3	0.3	0.2	0.2

(P= 0.01) higher than those of untreated plants with the exception of UPS 45 where the pod yield was reduced. With vinclozolin significant (P = 0.01) decrease in pod yield was shown by UPS 45, UPS 122 and SLS 100 whereas increase in pod yield in SLS 40 was not significant. Such exceptional behaviour by UPS 45 has already been reported during blight assessment after treatment with the same fungicides.[5]

Pod yields of SLS 7, TPT 1 and SLS 11 have improved by more than 50% with triademenol; but increases were lower with vinclozolin and bitertanol. Generally higher increases in pod yield of individual accessions (except UPS 45) as obtained on treatment with triademenol were not obtained on treatment with vinclozolin and bitertanol.

The number of flowers that escape blight and survive would directly determine the number of pods produced and hence, the pod yield. Any treatment that delays or controls *Choanephora* blight can bring about increases in pod yield. Such control of blight has already been reported by Gunasekera *et al*[4] using the same winged bean accessions and systemic fungicides under similar field conditions. Hence, the significant pod yield increases in the present work can be attributed to blight control. Furthermore, higher increases in pod yield (compared with controls) observed in triademenol–treated plants (Table 1) support observations of Gunasekera *et al*[4] that triademenol was more effective in controlling blight than vinclozolin and bitertanol.

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