

CONTROL OF SOME COMMON DISEASES OF BETELVINE BY FOLIAR APPLICATION OF CHEMICALS

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During the years 1987 and 1988 field trials were conducted to study the efficacy of different fungicides and antibiotics in controlling some common diseases of betelvine plantation in Tamluk area. The treatments consisted of five fungicides viz., Blitox, Dithane M-45, Captan, Foltaf, Bavistin and four antibiotics, Streptomycin sulphate, Ampicillin, Tetracycline hydrochloride and Amoxicillin each as foliar spray at 15 days intervals in rainy season and 22 days intervals in dry season. The results indicate that foliar sprays of combination of the fungicide Foltaf and the antibiotic Streptomycin sulphate reduced the mortality of vines, leaf rot and spot diseases of betelvine.

Key words : Betelvine, Fungal and Bacterial Diseases, Chemicals, Control.

INTRODUCTION

Betelvine (*Piper betel* L.) is one of the important cash crops of India, including West Bengal. The most important betelvine growing districts in West Bengal are Midnapore, specially East and Southern parts, Howrah, Hooghly, 24-Parganas and Nadia. The crop is often severely attacked by several fungal and bacterial diseases (Chattopadhyay, 1967) and cause serious economic losses to the growers every year.

Common diseases of betelvine in West Bengal include (i) leaf-rot and foot-rot caused by *Phytophthora* spp., *Sclerotium rolfsii* and *Maorophomina phaseolina*, (ii) leaf-spot and stem anthracnose caused by *Colletotrichum* spp., *Fusarium semitectum* and *Xanthomonas betlicola* (Laha 1982). While foot rot may result in the complete death of the vine, leaf diseases not only reduce the yield, but due to damage on the leaves the market value is also very much reduced. In stem anthracnose vines show signs of wilting and the leaves drop and become pale. Finally the vine completely wilts and dries up. In view of regular occurrence of these diseases in 'Barojes' of Tamluk area (Dist. Midnapore) a field trial at a farmer's "baroj" using some fungicides and antibiotics was undertaken.

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MATERIALS AND METHODS

The field experiments were conducted in 1987 and 1988 in 'Barojas' at Bhabani Chak village which is an intensive betelvine growing pocket of Tamluk sub-division. The treatments consisted of 5 fungicides, namely, (i) 0.3% Blitox (50% W. P. Copper oxychloride) (ii) 0.2% Dithane M-45 (75% W. P. manganese ethylene-bisolithio carbamate + zinc) (iii) 0.2% Captan (75% W. P. N-trichloromethylmercapto 4-Cyclohexane-1,2 dicarboximide) (iv) 0.2% Foltaf (80% W. P. Cis-N (1,1,2,2, -tetrachloro-ethylthio) -4-Cyclohexeno 1,2 dicarboximide) (v) 0.1% Bavistin (Methyl 2-benzimidazole carbamate) and 1000 ppm 4-antibiotics namely (i) Septomycine sulphate (ii) Ampicillin (iii) Tetracycline hydrochloride and (iv) Amoxicillium. Two rows containing 125 vines each consisted a replication. Each replication was separated by a buffer row. Four replication for each treatment were taken as a randomized way. The first spray was given in the month of May (2nd week) at pre-monsoon. Further sprays were given at intervals of 15 days during rainy season and 22 days during the rest of the year on 1½ years old Bangla-Kali plants. Observation on leaf spot, leaf-rot and mortality of vines were recorded at monthly intervals and score card was maintained. Randomly 100 leaves were harvested at 2 ft. height from each replication of a treatment for leaf spot of betelvine. In case of leaf rot of betelvine the number of infected leaves as well as fallen infected leaves from each treatment rows were counted; the total number of healthy leaves from each treatment rows were counted; the total number of healthy leaves of 20 vines and number of vine in each replication were also recorded. Both the diseases were rated on a 0-4 scale, where 0=healthy leaves, 1=1-5% leaf area damage; 2=6-10% leaf area damage, 3=11-25% leaf area damage; 4=above 25% leaf area damaged percent disease intensity (PDI) was calculated as follows:

$$PDI = \frac{\text{Sum of all numerical rating}}{\text{total number of leaf} \times \text{maximum score point}} \times 100$$

The disease control percentage was calculated according to the method followed by Gupta *et al.* (1978)

$$\% \text{ Disease control} = \frac{\text{Disease in control} - \text{Disease in treatment}}{\text{Disease in control}} \times 100$$

RESULTS AND DISCUSSION

From the data presented in Tables 1 & 2, this was clear that all the treatments gave significantly reduced disease incidence both in case of stem anthracnose as well as foliar diseases. Percent disease control in various treatments over the control varied from 91 to 47 percent in different treatments in case stem anthracnose and 52.99 to 8.72 percent in case of foliar diseases considering results of the years 1987 and 1988. Among the various treatments, however, there was significant difference in the efficacy in the disease control. While in case of foliar

Table 1. Efficiency of some chemicals spray on the control of stem anthracnose disease of betelvine.

Treatments	Doses	1987		1988	
		Mortality of vines	Percentage control	Mortality of vines	Percentage control
Blitox	0.3%	45	30.6 (33.58)	28	65 (53.73)
Dithane M-45	0.2%	50	23 (28.66)	40	50 (45.00)
Captan	0.2%	51	21 (27.27)	42	47 (43.28)
Foltaf	0.2%	48	26 (30.66)	31	61 (51.35)
Bavistin	0.1%	43	33 (35.06)	25	69 (56.17)
Streptomycin sulphate	1000 ppm	26	60 (50.77)	18	77 (61.34)
Ampicillin	1000 ppm	34	47 (43.28)	23	71 (57.42)
Tetracycline	1000 ppm	31	52 (46.15)	20	75 (60.00)
Amoxicillin	1000 ppm	29	55 (47.87)	26	67 (54.94)
Foltaf + Streptomycin sulphate	0.2% + 1000 ppm	22	66 (54.33)	7	91 (72.54)
Control (spray with water)		65	0 (0)	80	(0)
C.D.			0.59		1.164

Table 2. Efficiency of some chemicals spray on the control of leaf rot & spot diseases of betelvine.

Treatment	Dosage	Percent Disease Intensity		Percent Diseases Control	
		1987	1988	1987	1988
Blitox	0.3%	22.61(28.40)	17.54(24.77)	20.56(26.95)	34.33(35.87)
Dithane M-45	0.2%	26.32(30.86)	20.37(26.82)	13.68(21.70)	28.89(32.51)
Captan	0.2%	29.08(32.63)	25.62(30.41)	8.72(17.18)	19.38(26.12)
Foltaf	0.2%	18.91(25.78)	15.31(23.03)	27.89(31.87)	38.94(38.60)
Bavistin	0.1%	20.64(27.02)	16.95(24.31)	24.42(29.61)	35.55(36.60)
Streptomycin sulphate	1000 ppm	17.87(25.01)	15.05(22.83)	30.04(33.24)	39.47(38.91)
Ampicillin	1000 ppm	20.31(26.79)	16.68(24.10)	25.06(30.04)	36.11(36.94)
Tetracycline	1000 ppm	21.15(27.38)	16.80(24.20)	23.41(28.94)	35.84(36.77)
Amoxicillin	1000 ppm	22.03(28.00)	17.32(24.59)	21.68(27.75)	34.81(36.15)
Foltaf + Septomycin sulphate	0.2% + 1000 ppm	15.60(23.26)	9.27(17.73)	34.93(36.22)	52.99(46.71)
Control (Spray with water)	—	34.12(35.75)	37.44(37.72)	—	—
C.D.		0.7037	0.69	0.81	0.6034

*Angular transformation values are in bracket.

diseases fungicidal treatments gave better control, in case of stem anthracnose antibiotic treatments proved superior than the fungicides used. For both stem anthracnose and foliar diseases, however the combination of the fungicide Foltaf

and the antibiotic Septomycin Sulphate gave best result in the studies conducted during years 1987 and 1988. Regular spraying of the crop with the fungicide and antibiotic combination at three weeks intervals during the dry season and two weeks interval during the rainy season can, there-fore be recommended for controlling the diseases and also obtaining better quality and higher yield.

REFERENCES

- Chattopadhyay, S.B. (1967). *Diseases of Plants Yielding Durgs, Dyes and Spices*. I.C.A.R. New Delhi.
- Gupta, P.C., Madaan, R.L., and Grover, R.K. (1978). Occurrence of powdery mildew of Ber in Haryana and its control. *Ind. Phytopath* 31 : 440-443.
- Laha, J.N. (1982). Common Fungal Diseases of Betelvine in West Bengal. Proceedings of the National Workshop on Betelvine 1982, pp. 181-187.

(Accepted for publication September 18 1989)