

EFFECT OF INTERCROPPING ON THE INCIDENCE OF DISEASES OF GROUNDNUT

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ABSTRACT

The effect of intercropping on the incidence of groundnut ring mosaic caused by a strain of Tomato Spotted Wilt Virus (TSWV) could be seen only at 30 days after sowing. Sorghum as intercrop and barrier crop, cumbu as intercrop in groundnut significantly reduced the incidence of ring mosaic, late leaf spot and rust. Sunflower either as intercrop or barrier crop in groundnut was not effective in reducing the incidence of all the three diseases.

KEYWORDS : Groundnut diseases, intercropping

The ring mosaic (bud necrosis) disease of groundnut caused by TSWV is now considered to be one of the most damaging groundnut virus diseases in India (Ghanekar *et al.*, 1979; Reddy, 1983). Among foliar diseases, late leaf spot and rust diseases are the most important diseases causing appreciable loss. To contain the above diseases of groundnut, several disease management principles have to be integrated. The effect of the intercropping millets and sunflower with groundnut on incidence of ring mosaic, late leaf spot and rust was studied and the results are presented.

MATERIALS AND METHODS

Two field trials were laid out at Agricultural College and Research Institute, Madurai and in farmer's holding at Tirumangalam, Madurai district (Tamil Nadu) with groundnut cultivars TMV 7 and Co 1 respectively during summer season (March-June, 1985) in a randomised block design with a plot size of 4.5 x 3.0 M with a spacing of 15 x 15 cm replicated three times.

The details of treatments were as follows: sorghum barrier crop in groundnut (T₁), sorghum intercrop in groundnut (T₂), cumbu barrier crop in groundnut (T₃), cumbu intercrop

in groundnut(T₄), sunflower barrier crop in groundnut(T₅), sunflower inter crop in groundnut(T₆) and groundnut sole crop(T₇).

The incidence of groundnut ring mosaic was recorded from 20th day after sowing till 10 days before harvest. The incidence of late leaf spot and rust diseases were recorded 10 days before harvest and expressed as per cent disease index (PDI) using the scale described by Subramanyam *et al.* (1982).

RESULTS AND DISCUSSION

The analysis of data (Table 1) indicated that the disease on 20 DAS was not significantly altered by any of the treatments in both the locations. But sorghum and cumbu (pearl millet) grown as intercrop and barrier crop were effective in reducing the incidence of groundnut ring mosaic caused by a strain of TSWV. Sorghum as intercrop was most effective in reducing the incidence of groundnut ring mosaic throughout the period of observation. Sunflower both as intercrop and barrier crop was not effective in reducing the incidence of groundnut ring mosaic. Intercropping cowpea with either cassava or plantain reduced the incidence of cowpea mosaic virus and cowpea chlorotic virus as compared with a cowpea monoculture (Moreno, 1979).

Table 1. Effect of Intercropping on the Incidence of Ring Mosaic Disease of Groundnut.

Treatment	Mean of two locations Ring mosaic incidence (%) [*] on		
	20th day	30th day	100th day
T ₁	30.01 (9.98)	3.87 (11.34)	4.9 (12.78)
T ₂	3.15 (10.20)	3.62 (10.90)	4.47 (12.16)
T ₃	2.95 (9.85)	4.09 (11.66)	5.3 (13.33)
T ₄	2.92 (9.77)	3.79 (11.18)	4.85 (12.69)
T ₅	3.00 (9.97)	4.77 (12.58)	6.82 (15.13)
T ₆	3.05 (10.09)	4.95 (12.84)	7.52 (15.88)
T ₇	3.35 (10.56)	6.05 (14.21)	10.02 (18.45)
CD (0.05)	N.S.	2.08	2.76

* Mean of three replications.

Data in parenthesis are arcsine value.

Regarding the effect on foliar fungal diseases, it is observed that intensity of both late leaf spot and rust diseases were effectively reduced to 29.39 and 34.94 per cent respectively by growing cumbu as intercrop as against the 34.12 and 38.45 per cent in groundnut as sole crop. Sorghum when grown as intercrop was able to exert similar influence on the intensity of both late leaf spot and rust disease. Similar results were obtained in ICRISAT, when six groundnut varieties with varying degrees of resistance to rust and cercospora leaf spot diseases were grown as intercrop with pearl millet (1 row pearl millet and 3 row of groundnut) (ICRISAT, 1981). Severity of rust of beans was reduced when intercropped with corn when compared to bean grown as monoculture (Moreno, 1979).

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Table 2. Effect of intercropping on the incidence of the leaf spot and rust diseases of groundnut.

Treatment	Per cent disease index Mean of two locations	
	Late leaf spot	Rust
T ₁	31.55 (34.15)	36.54 (37.13)
T ₂	29.77 (33.04)	33.85 (35.62)
T ₃	32.11 (34.47)	36.44 (37.06)
T ₄	29.39 (32.92)	34.94 (36.20)
T ₅	32.30 (34.63)	37.17 (37.53)
T ₆	31.85 (34.35)	36.29 (37.00)
T ₇	34.12 (35.84)	38.45 (38.28)
CD (0.05)	2.18	2.20

Mean of three replications.

Data in parenthesis are arcsine transformed value.

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EFFECT OF GRADED LEVELS OF POTASSIUM ON PECTINOLYTIC AND CELLULOLYTIC ENZYMES IN BLAST INFECTED LEAVES OF RICE

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ABSTRACT

The effect of increasing doses of potassium against *Pyricularia oryzae* inoculation on the production of pectinolytic and cellulolytic enzymes in inoculated leaves was studied in rice variety IR..50. The activity of protopectinase (PP), polygalacturonase (PG), polygalacturonate trans - eliminase (PGTE), Pectin trans - eliminase (PTE) and cellulases (C₁ and C_x) was found to decline due to higher levels of potassium. On the other hand, β - glucosidase activity was enhanced markedly as the rate of potassium application increased. The increased β - glucosidase activity due to increased application of potassium inhibited the lesion development, thereby resisting the entry of the pathogen into the host.

KEY WORDS : Rice blast, Potassium, Enzyme production

Rice crop suffers from a number of fungal, bacterial and viral diseases. A fungal disease, blast incited by *Pyricularia oryzae* Cav. causes severe reduction in yield upto 80 per cent (Muralidharan and Venkata Rao, 1981). It is possible to induce resistance in

crop plants by balanced application of fertilisers. Application of potassium fertilizer was found to impart disease resistance (Trolldenier, 1969). Enzymes are known to be the important chemical weapons of the pathogens. Hence a potculture experiment was conducted to