

## Management of cowpea wilt by organic amendments

N.N. PATEL, K.R. JOSHI, P.M. PATEL, M.R. PATEL AND R.M. PATEL

International Journal of Plant Protection (October, 2010), Vol. 3 No. 2 : 350-352

See end of the article for authors' affiliations

Correspondence to :  
N.N. PATEL  
Department of Plant  
Pathology, Main Forage  
Research Station,  
Anand Agricultural  
University, ANAND  
(GUJARAT) INDIA

### SUMMARY

A field experiment was conducted at Main Forage Research Station, Anand Agricultural University, Anand during *Kharif* 2007 to find out the efficacy of eight organic amendments against wilt of cowpea [*Vigna unguiculata* (L.) Walp.] caused by *Fusarium solani*. The organic amendments were applied in soil (Neem expelled, hull and cake 766 g/ each plot 7.2 m<sup>2</sup>, Castor cake 400 g/plot, cotton and maize cake 600/g each plot. FYM 2.8 kg/plot and poultry manure 700 g/plot) before sowing and kept for decomposition upto 14 days. Sowing was done in the third week of July by keeping 60 x 60 cm spacing. Randomized Block Design was used with eight treatments and three replications. The mortality of the plants in different treatments were observed as pre and post-emergence. The data revealed that all the organic amendments were found significantly effective in reducing mortality of plants as compared to control. Neem expelled cake (16.80) was significantly superior in reducing plant mortality which was at par with neem cake (16.93).

### Key words :

Rust disease,  
*Puccinia*  
*penniseti*, Bajra,  
Ahmedpur

Cowpea [*Vigna unguiculata* (L. Walp.) ] is an important leguminous forage crop, which serves as a good source of protein for animal, but for last few years a severe wilt was observed in middle of Gujarat state. The pathogen was isolated and identified as *Fusarium solani* L. (ITCC No. 5598, 07). The wilt of cowpea has also been reported from different parts of India by Singh (1954); Monga and Grover (1991) and Ushamalini *et al.* (1998).

The disease is very important as it causes heavy losses (15 to 75 %) in yield of fodder as well as grain (Singh, 1954; Haware, 1993 and Florini, 1997). Looking to the seriousness of the disease, it was thought necessary to overcome the loss due to the disease and to find out effective organic amendment for its control.

### MATERIALS AND METHODS

With a view to determine the inhibitory effect of various amendments against wilt of cowpea, the field trial was conducted at Main Forage Research Station (Navli village), Anand Agricultural University, Anand during *Kharif* 2007 in Randomized Block Design (RBD) with 8 treatments each replicated thrice. All the recommended agronomical practices were followed. Seed of cowpea (EC 4216) was sown with 60 x 60 cm spacing in third week of July-

2007. Before sowing of cowpea seeds, all the organic amendments were mixed in the soil and kept for decomposition upto 14 days. Observations on per cent mortality and per cent plant stand were recorded at regular interval. Experimental detail is given here under:

Treatment	Concentration
Neem expelled cake	766 g / plot
Neem hull cake	766 g / plot
Neem cake	766 g / plot
Castor cake	400 g / plot
Cotton cake	600 g / plot
Maize cake	600 g / plot
F.Y.M.	2.8 kg / plot
Poultry manure	700 g / plot
Control	No amendments

### RESULTS AND DISCUSSION

The field experiment was conducted to assess the effect of organic amendments on the incidence of cowpea wilt. The data (Table 1) revealed that all the organic amendments were significantly effective in reducing cowpea wilt incidence and improved seed germination. Seedling mortality was very high in control plots.

The germination data revealed that all the organic amendments were significantly superior to control. Maximum germination percentage was observed in neem cake (94.13), which was at par with neem expelled cake (90.09). The

Accepted :  
September, 2010

**Table 1 : Effect of organic amendments on wilt of cowpea (Kharif 2007)**

Sr. No.	Treatments	Plant mortality (%)			
		Germination (%)	Pre emergence	Post emergence	Total mortality
1.	Castor cake	59.02 * (73.50)**	33.82 (30.97)	19.61 (11.26)	38.08 (38.03)
2.	Neem hull cake	62.04 (78.01)	27.95 (21.96)	19.42 (11.05)	35.12 (33.09)
3.	Neem cake	75.99 (94.13)	13.99 (5.84)	19.61 (11.26)	24.30 (16.93)
4.	Neem expelled cake	71.66 (90.09)	18.32 (9.87)	16.38 (7.95)	24.20 (16.80)
5.	Poultry manure	50.33 (59.24)	39.65 (40.71)	20.26 (11.99)	46.59 (52.77)
6.	FYM	49.69 (53.41)	42.33 (45.34)	20.45 (12.20)	49.39 (57.63)
7.	Cotton cake	45.40 (50.69)	44.60 (49.30)	21.09 (12.94)	52.10 (62.26)
8.	Maize cake	46.06 (51.84)	43.79 (46.88)	26.46 (19.85)	55.75 (68.32)
9.	Control	36.87 (36.00)	53.11 (63.96)	26.63 (20.09)	61.94 (77.87)
	S.E. $\pm$	2.64	2.36	1.42	1.88
	C.D. (P=0.05)	7.92	7.08	4.27	5.64
	CV %	8.33	11.59	11.68	7.57

\* Figure indicates arsine transformed value

\*\* Figure in parentheses are retransformed value

next best in order of merit was neem hull cake (78.01) followed by castor cake (73.50), poultry manure (59.24), F.Y.M. (53.41), maize cake (51.84) and cotton cake (50.69). Minimum germination percentage was recorded in control plot (36.00). Significantly minimum pre-emergence plant mortality was recorded in neem cake (5.84 %) which was at par with neem expelled cake (9.87). The next best in order of merit was neem hull cake (21.96) followed by castor cake (30.97), poultry manure (40.71), FYM (45.34), maize cake (46.88) and cotton cake (49.30).

Significantly maximum pre-emergence plant mortality was obtained in control plot (63.96). Post-emergence plant mortality was obtained minimum in neem expelled cake (16.38) which was at par with neem hull cake (11.05), neem cake (11.26), castor cake (11.26), poultry manure (11.99) and F.Y.M. (12.20) followed by cotton cake (12.94) and maize cake (19.85).

All the organic amendments were found significantly effective in reducing total plant mortality as compared to control. Neem expelled cake (16.80) was significantly superior in reducing total plant mortality which was at par with neem cake (16.93). The next best in order of efficacy was neem hull cake (33.09) followed by castor cake (38.03), poultry manure (52.77), F.Y.M. (57.63), cotton cake (62.26) and maize cake (68.32) where as highest plant mortality was observed in control (77.87).

It is evident from the data Table 1 that neem expelled cake, neem cake and neem hull cake were found most effective in reducing wilt of cowpea, which is in conformity with the work of Srivastava and Singh (1991). Pandmodaya and Reddy (1999), also reported neem cake

as effective against *F. solani* and *F. oxysporum* f. sp. *lycopersici*.

#### Authors' affiliations:

**K.R. JOSHI**, Department of Plant Pathology, Main Forage Research Station, Anand Agricultural University, ANAND (GUJARAT) INDIA

**P.M. PATEL AND M.R. PATEL**, Department of Agronomy, Main Forage Research Station, Anand Agricultural University, ANAND (GUJARAT) INDIA

**R.M. PATEL**, Department of Biochemistry, Main Forage Research Station, Anand Agricultural University, ANAND (GUJARAT) INDIA

#### REFERENCES

- Florini, D.A. (1997)**. Nematodes and other soil borne pathogens of cowpea. In Singh, B. B., Mohanraj, K. E. and Jackai, L. E. N. (Ed.) *Advance in cowpea research*. International Institute of Tropical Agriculture, Ibadan, Nigeria and Japan. U.K. Publication. 193 pp.
- Haware, M.P. (1993)**. Fusarium disease of crops in India. *Indian Phytopath.*, **46** (2) : 101-109.
- Monga, D. and Grover, R.K. (1991)**. Chemical control of root rot of cowpea in relation to altered pathogenicity of *Fusarium solani*. *Indian Phytopath.*, **44** (4) : 462-469.
- Pandmodaya, B. and Reddy, H.R. (1999)**. *J. Mycol. Pl. Pathol.*, **29** (1) : 38-41.
- Singh, R.S. (1954)**. Wilt of lobia in Uttar Pradesh. *Sci. Cul.*, **19** (9) : 454-456.

**Srivastava, A.K. and Singh, R.B. (1991).** Use of organic amendment against *Fusarium solani* and *Meloidogyne incognita* on *Phaseolus vulgaris*. *New Agriculturists*, **2** (1) : 63-64.

**Ushamalini, C., Rajappan, K. and Gangadharan, K. (1998).** Changes in biochemical constituents of cowpea due to seed borne fungi. *Indian Phytopath.*, **51** (3) : 258-260.

\*\*\*\*\*