

Soil Amendment with Oil Cakes in Ginger Field for Rhizome Rot Control

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랄타코레, B.B.·S. 마투르 · R.B. 싱 · B.P. 차크라바르티 : Oil Cake 토양첨가에 의한 생강뿌리썩음병의 방제

Korean J. Plant Prot. 26(4) : 267~268(1987)

ABSTRACT Out of 8 oil cakes used for soil amendment, Margosa, Undi and Karanj cakes were found to reduce the ginger rot. However, maximum increase in yield was found in Karanj cake followed by Roselle and Mustard cakes.

Organic amendment for controlling soil borne pathogens is gaining importance in recent years (Singh, 1983). Reduction in disease severity can often be obtained by organic amendments of soil apparently through the amendment in microbial antagonism including antibiosis, competition or other mechanism. Several diseases caused by soil borne pathogens have been reported to be controlled by suitable amendments of soil with organic matter(1, 2, 5). Rhizome rot of ginger is caused by *Pythium aphanidermatum* and *Fusarium solani* in Rajasthan, India and it could be partially controlled by seed treatment and soil application of fungicides(3, 6). Application of fungicides in soil may not be economical and at the same time it may disturb the soil ecosystem. In India oil cakes which are by-products after extraction of oil bearing seeds are used as organic manure. It is not known if application of oil cakes would control or reduce rhizome rot of ginger.

MATERIALS AND METHODS

Oil cakes of Roselle (*Hibiscus sabdariffa* Linn.), Undi (*Calophyllum inophyllum* Linn.), Karanj or Indian beech (*Pongamia olabra* Vent.), Mustard(*Crassica campestris* L.), Sal

or Resin tree (*Shorea robusta* Gaertn. f.), Margosa(*Azadirachta indica*, A. Juss.), Mahua or Butler tree (*Bassia latifolia* Roxb.) and Safflower (*Carthamus tinctorius* Linn.) were used as soil amendment. These cakes were finely ground in mechanical grinder before being incorporated into the inoculated plots 15 days before sowing to allow decomposition. The suspension (mycelium and spore) of *Fusarium solani* and *Pythium aphanidermatum*, the pathogens of ginger rot, was added in each plot 3 times before sowing to allow the pathogens to establish. The oil cakes were added at the rate of 25 q/hactare. The seeds (Rhizomes) were inoculated before sowing with *F. solani*(*Fusarium solani* (Mart) Sacc.) and *P. aphanidermatum* (*Pythium aphanidermatum* (Edson) Fitzpatrick). The treatments were replicated 4 times and experiment was carried out for 3 years in the field. The observations on germination, rotting of rhizomes and yield /plot were recorded.

RESULT AND CONCLUSION

Effect on germination. There was no significant effect on germination of rhizome in plots amended with different oil cakes. Germination in treatments were ranged from 82 to 90% (Table 1).

Effect on disease incidence. The infection

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Table 1. Effect of oil-cake amendments on disease development of rhizome rot of ginger

Treatments	Mean		
	% Germination	% Rotting	% Increase in yield
Margosa cake	87.73	6.39	86.95
Unid cake	90.46	9.47	88.99
Karanj cake	92.00	9.99	180.92
Mahua cake	85.27	8.62	96.03
Roselle cake	89.47	9.66	132.58
Mustard cake	82.84	13.78	131.16
Cal cake	82.76	15.09	84.7
Safflower cake	84.66	10.89	28.46
Control	85.51	11.02	—
S.Em ±	2.06	1.62	0.830
C.D. 5%	6.0755	2.306	3.428

was found to be reduced in treatments with Margosa cake and Mahua cake, followed by Und and Roselle cakes. Nevertheless there was no reduction in rotting percentage in other treatments as compared to check plot in which it was 11.02.

Effect on yield. All treatments were found to effect the yield of the rhizome. Due to nutritional value of oil cakes, which are used as manure, there was increase of yield in all the treatments. Nonetheless, the maximum yield was recored when Indian beech, Roselle and mustard cakes were used as soil amendments. Therefore, it is concluded from 3 years experimentation that when oil cakes viz. Indian beech, Mustard and Roselle are added to soil, they not only increased the yield significantly but also reduced the infection.

Acknowledgement. Thanks are due to authorities of Sukhadia University for providing facilities.

적 요

토양에 첨가한 8종의 Oil cake 중 Margosa,

Undi, Karanj cake은 생강뿌리썩음병의 발생을 억제하였다. 생강수량의 증진효과는 Karanj, Roselle, Mustard cake의 순으로 높았다.

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