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EFFICACY OF DIFFERENT OIL CAKES AGAINST M.INCOGNITA ON LENGTH, FRESH AND DRY WEIGHT OF ROOT AND SHOOT OF GLYCINE MAX (SOYABEAN)

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ABSTRACT

The root knot nematode *Meloidogyne incognita* infest soyabean (*Glycine max*) along with other vegetable and Leguminous crops causes serious reduction in the growth and yield of crops. The experiment were carried out as a soil amendment with neem cake, mustard cake and castor cake at the rate of 5, 10, 15 gm/ pot and found that all the oil cake superior over untreated control but neem cake 15gm/pot provide best result to increase the length of root and shoot along with fresh and dry weight of root and shoot.

KEYWORD: *M.incognita*, Oil Cake, Soyabean.

INTRODUCTION

Plant parasitic nematodes are hidden enemies and have potential for serious reduction in growth and yield in wide range of crop plant. Root knot nematode *Meloidogyne incognita* infest many vegetables and leguiminous crop and cause huge losses in productivity. Soybean (*Glycine max*) is an impotent leguminous crop have high protein content and able to fix atmospheric nitrogen symbiotically .Serious yield losses in Soyabean takes place by root knot nematodes. In this experiment attempt was made to reduce root knot population and increase the growth of soyabean crop by soil amendment with the help of oil cakes. The experiment was carried out to determine the efficacy of neem, mustard and castor cakes in different dosage at the rate of 5, 10, 15 gm/pot for the management of root knot nematodes on soyabean as a soil application.

MATERIAL METHOD

The experiment was carried out in earthen pot to determine the efficacy of Neem cake, Mustard cake and Castor cake at the rate of 5, 10, 15, gm/pot against *Meloidogyne incognita.* 2kg sterilized soil filled in disinfested earthen pots with finely powdered oil cake as per doses mentioned above. These pots were exposed for two weeks to allow decomposition of oil cakes before sowing. The seeds of soyabean were sown in each pot after 15 days of soil amendment. One week old seedlings were the recommended inoculated with 2000 J2/pot. agronomic practices were adopted through out the experimentation. Each treatment including untreated checks were replicated three times. Three months after sowing the plants were depotted, washed and observations recorded were subjected to statistical analysis.

RESULT

The comparison of different doses of all the oil cakes were based on the value of three replication of test plants. Further, the comparative trends emerging from ANOVA were substantiated by the evaluation of efficiency of all three oil cakes in terms of growth parameters. The tool of Critical Difference (CD) was employed. The mean values of the three replicates have been mentioned in the parenthesis in the foregoing text.

(1) Effect on Shoot Length

The shoot length significantly increased when the plants were treated with different oil cakes. The highest enhancement in shoot length was recorded in the following sequences, Neem cake 15gm/pot (35.80 cm) > Neem cake 10 gm/pot (33.50 cm). The least effective dosage were 05 gm/pot dosage of mustard cake (28.60 cm)<Castor cake (28.80 cm)<Neem Cake (29.00 cm) were untreated control (28.60 cm). CD5%=5.231. **Fig-1.**

SOURCE	DF	SS	MS	FCAL	FTAB
REP	2	289.152	144.576	11.496	3.1
VARIETIES	10	627.868	62.787	4.993	2.32
ERROR	20	251.515	12.576		
	32	1168.535			
SEM=	1.773	SE=	2.508	CD5%=	5.231

(2)Effect on root length

The data on root length revealed that the soil treated with 15gm/pot were Superior and most efficient in order of 15gm/pot Neem cake followed by 15gm/pot dosage of mustard cake and castor cake. The 05 gm/pot castor cake had no effect on growth of root length and was at par with untreated control (7.80 cm).CD5%=0.257. **Fig-2.**

SOURCE	DF	SS	MS	FCAL	FTAB
REP	2	148.061	74.030	2443.000	3.1
VARIETIES	10	276.436	27.644	912.238	2.32
ERROR	20	0.606	0.030		
	32	425.102			
SEM=	0.087	SE=	0.123	CD_5%=	0.257

(3)Effect on Fresh shoot weight

The soil treated by the dose of 15gm/pot of different oil cakes enhance the fresh shoot weight. The order of their superiority was Neem cake (16.20 gm)> mustard cake(12.50 gm) > Castor cake (12.20 gm). The efficacy of Mustard cake (8.40 gm) and Castor cake 05 gm/pot (8.40 gm) were at par with each other and with untreated control (8.40 gm).CD5%=0.385. **Fig-3.**

SOURCE	DF	SS	MS	FCAL	FTAB
REP	2	145.136	72.568	1064.333	3.1
VARIETIES	10	415.769	41.577	609.795	2.32
ERROR	20	1.364	0.068		
	32	562.269			
SEM=	0.131	SE=	0.185	CD_5%=	0.385

(4)Effect on Fresh Root Weight

The statistical evaluation of data on dry shoot weight on the basis of ANOVA revealed that the growth was highly significant (CD5%=0.954) and superior at 15 gm/pot dosage. The sequence of superiority was as following Neem cake (6.80 gm)> Castor cake (4.40 gm)> Mustard cake (4.00 gm). There was no growth at 05 gm/pot, Mustard cake (1.20 gm) which was at par with untreated control (1.20 gm)CD5%=0.954. **Fig-4.**

SOURCE	DF	SS	MS	FCAL	FTAB
REP	2	41.636	20.818	49.783	3.1
VARIETIES	10	164.068	16.407	39.234	2.32
ERROR	20	8.364	0.418		
	32	214.068			
SEM=	0.323	SE=	0.457	CD_5%=	0.954

(5)Effect on Dry shoot weight:

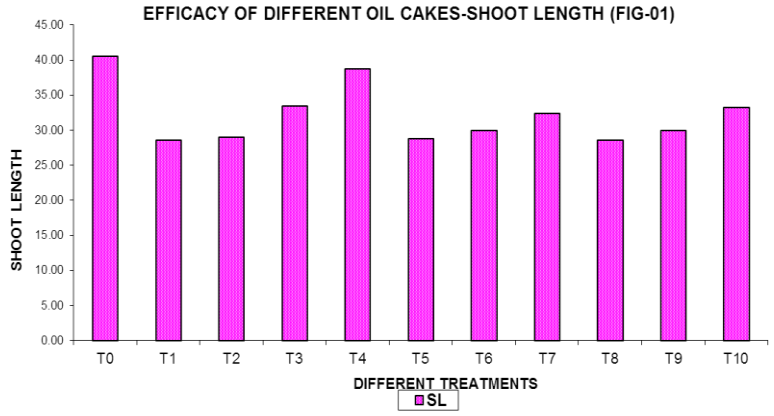
Plants amended with the different dosage of oil cakes recorded maximum growth at 15 gm/pot dosage of Neem cake (6.60 cm) followed by 10 gm/pot dosage of Neem cake (4.90) which was at par with 15 gm/pot Castor cake (4.80 gm) & Mustard cake (4.70 gm). The least effective dose was 05 gm/pot mustard cake (3.20 gm) over untreated control (2.20 gm). CD5%=0.770. **Fig-5.**

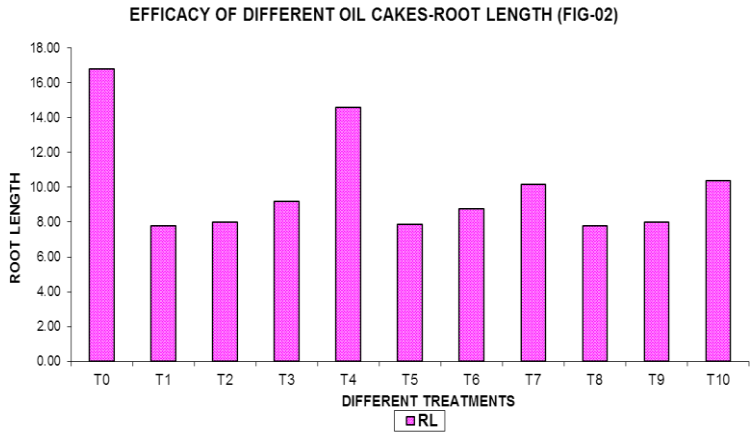
SOURCE	DF	SS	MS	FCAL	FTAB
REP	2	60.545	30.273	111.000	3.1
VARIETIES	10	92.230	9.223	33.818	2.32
ERROR	20	5.455	0.273		
	32	158.230			
SEM=	0.261	SE=	0.369	CD_5%=	0.770

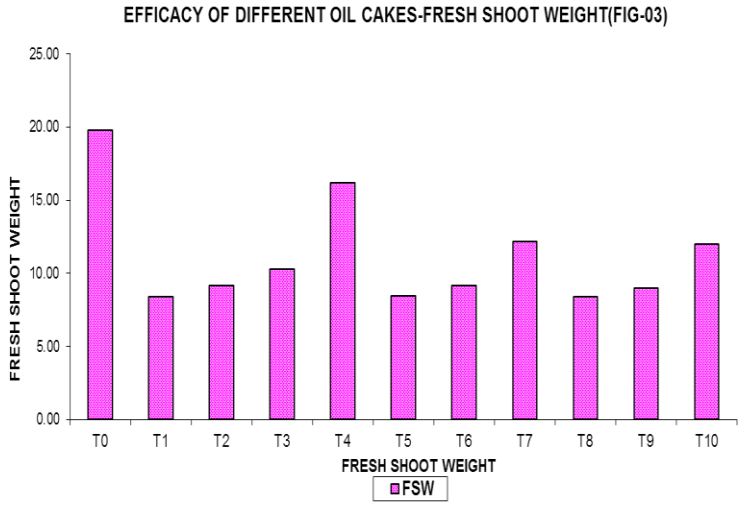
(6)Effect on dry root weight

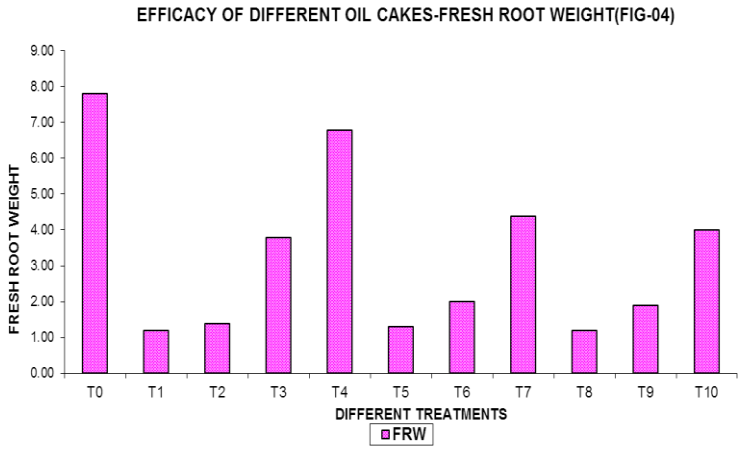
The statistical analysis of data on the root weight exhibited high degree of significance by ANOVA. The maximum root weight was recorded at 15 gm/pot dosage of Neem cake (1.50 gm) followed by 15 gm dosage of Castor cake which was at par with 15 gm/pot dosage of mustard cake. Mustard cake at 05 gm/pot dosage (0.60 gm) found to be non-effective and was at par with untreated control (0.60 gm).CD5%=0.251%. **Fig-6.**

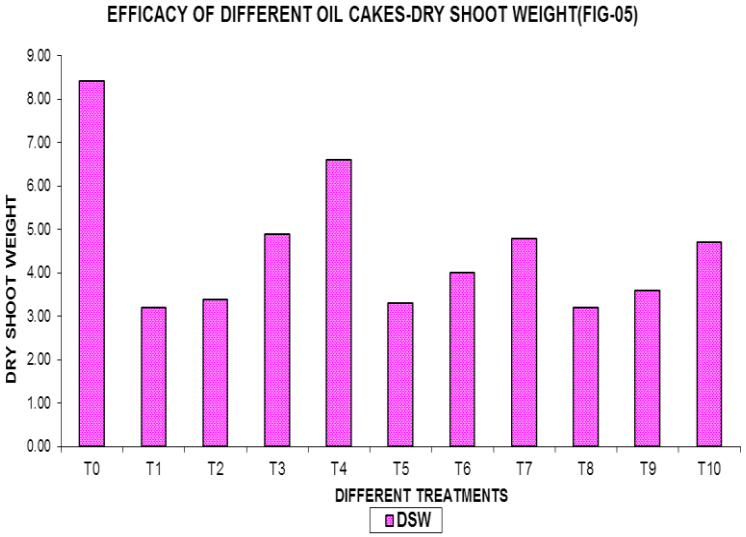
SOURCE	DF	SS	MS	FCAL	FTAB
REP	2	5.702	2.851	98.616	3.1
VARIETIES	10	4.460	0.446	15.429	2.32
ERROR	20	0.578	0.029		
	32	10.740			
SEM=	0.085	SE=	0.120	CD_5%=	0.251

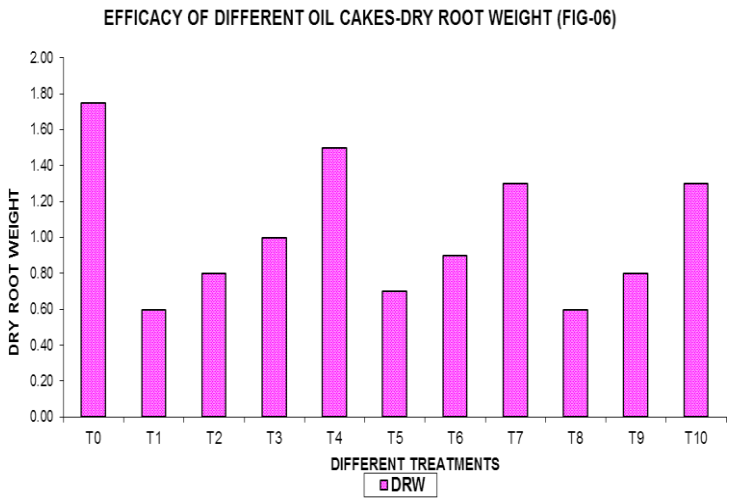





EFFICACY OF DIFFERENT OIL CAKES-FRESH SHOOT WEIGHT(FIG-03)
25.00
20.00
15.00
10.00
5.00
0.00
FRESH SHOOT WEIGHT
T0 T1 T2 T3 T4 T5 T6 T7 T8 T9 T10
FRESH SHOOT WEIGHT
FSW


EFFICACY OF DIFFERENT OIL CAKES-FRESH ROOT WEIGHT(FIG-04)
9.00
8.00
7.00
6.00
5.00
4.00
3.00
2.00
1.00
0.00
FRESH ROOT WEIGHT
T0 T1 T2 T3 T4 T5 T6 T7 T8 T9 T10
DIFFERENT TREATMENTS
FRW


EFFICACY OF DIFFERENT OIL CAKES-DRY SHOOT WEIGHT(FIG-05)
9.00
8.00
7.00
6.00
5.00
4.00
3.00
2.00
1.00
0.00
DRY SHOOT WEIGHT
T0 T1 T2 T3 T4 T5 T6 T7 T8 T9 T10
DIFFERENT TREATMENTS
DSW



DISCUSSION

The experiment illustrated that all the treatment were superior over untreated inoculated control. Application of organic amendments (oil cake) result in the release of plant nutrients which accelerate root development and over all plant growth and thus helping the plants to escape nematode attack. Nematicidal and Nutritive value indicated by organic amendment would have promoted plant growth Zaiyd (1977). Result of the present investigation were in conformity with the finding of Mishra and Prasad (1974), Pandey and singh (1990) who had also applied the oil cakes of Neem, castor and mustard in soil and observed a significant increases in plant growth characters and reduced nematodes population of *M.incognita*, *Retylenchulus reniformis* and *Tylenchorhychus brassicae*. Addition of organic amendment also resulted in accumulation of nitrates and ammonia in high concentration, which was highly injurious to several nematodes in soil (Singh & Sitaramiah 1973). Addition of organic matter to soil as an alternative means of nematode control was also explored by Suhail & Anvar (2006).

The results of our study suggest that the application of oil cakes can control root knot nematodes effectively thus resulting in increased plant growth. Among the three oil cakes neem cake proved to be the most beneficial followed by mustard and castor in improving plant growth characters and suppressing nematode population. Mukesh Sehgal et al (2014) reported that caster cake and neem oil combination increase the pod yield in groundnut.

Vaitheeswaran et al. (2005) found that growth was maximum in Neem oil cake treated infected plant of Phaseolus mungo. Manju Meena, S.Bhargava, M.K. Sharma and H.R. Gurjar (2013) reported that leaf extract of neem at 20% was found to be the best treatment in

improving plant growth characters and in reducing nematode population on tomato. Seenivasan, (2010) also found that Neem cake was more efficacious than castor cake in reducing nematode population in medicinal coleus.

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