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SHORT COMMUNICATIONS

EFFECT OF TILLAGE PRACTICES AND NUTRIENT MANAGEMENT ON YIELD AND ECONOMICS OF FODDER OAT

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SUMMARY

A field experiment was conducted at IGKV, Raipur, Chhattisgarh during **rabi** season of 2011-12 to study the effect of tillage practices and nutrient management on growth, fodder yield and quality of oat (*Avena sativa* L.). The treatments comprised zero tillage, minimal tillage and conventional tillage in main plots and 75 per cent RDF, 75 per cent RDF+Bio-fertilizers, 100 per cent RDF, 100 per cent RDF+Bio-fertilizers in sub-plots. The experiment conducted showed that highest green and dry fodder yields were recorded in the plots treated with conventioanl tillage. Highest net returns and B : C ratio were recorded under plots treated with conventional tillage. In case of nutrient management, highest green fodder and dry fodder yields and net returns and B : C ratio were recorded in the plots treated with 100 per cent RDF+Bio-fertilizers (*Azotobacter* and PSB).

Key words : Tillage practice, nutrient management, yield, economics, oat

India has the largest population of animals of about 17 per cent of the world's livestock population but the productivity of animals in India especially is very low because of lack of proper nutritious feed. Feed plays important role in exploiting the growth and production potential of animals but the resources available for growing fodder and forage are low. Feeding of livestock with concentrates increases the productivity but it is not economical to farmers. Green forage is one of the ways to replace the concentrates but it becomes limited during **rabi** season (Sharma *et al*., 2004). Among the fodder crops, oat (*Avena sativa* L.) is an important fodder crop of **rabi** season and requires a greater attention to increase fodder production as well as its quality. Due to its excellent quick regrowth habit, it is very popular for forage. The fodder oat needs copious fertilizers for succulent and quality herbage production (Hukkeri *et al*., 1977). Balanced nutrient supply ensures efficient use of all nutrients. Inorganic fertilizers are supplying major plant nutrients, but the application of heavy dose of inorganic fertilizers causes water pollution and soil degradation, etc. Hence, emphasis is now being put on bio-fertilizers like *Azotobacter* and phosphorus solubilizing bacteria. Tillage also plays an important role in the productivity of crop. Keeping these points in view, an experiment was conducted.

The present investigation was carried out at Research-cum-Instructional Farm, IGKV, Raipur, Chhattisgarh during **rabi** season of 2011-12 in an elevation of 298.56 m above mean sea level, $21^0 16'$ north latitude and $81^0 36'$ east longitude. Soil of the experimental field was clayey in texture and belonged to vertisol which was low in nitrogen, medium in phosphorus and medium in potassium. Treatments were arranged in split plot design with three replications. Three methods of tillage were allotted to main plots zero, minimal and conventional tillage and four levels of nutrient management were allotted to sub-plots viz., 75 per cent RDF, 75 per cent RDF with combination of bio-fertilizers viz., *Azotobacter* and PSB, 100 per cent RDF and 100 per cent RDF with combination of bio-fertilizers. Full dose of P_2O_5 and K_2O was applied as basal dressing in the form of SSP and MOP along with 1/3 dose of nitrogen through urea as per treatments in each plot and was mixed thoroughly in soil. The remaining dose of nitrogen as per treatments was top dressed equally in two splits, at 20 and 40 DAS. The seed was sown at the rate of 100 kg/ha and sowing was done on 24 November 2011. Data were recorded on green and dry fodder yield and economical and statistical analyses were done.

Fodder Yield

Conventional tillage recorded higher green (342.23 q/ha) and dry (79.42 q/ha) fodder yields than minimal tillage and zero tillage (Table 1). This might be due to more vegetative growth and growth attributes obtained through the availability of nutrients from deeper layers as roots penetrate into deeper layers in plots treated with conventional tillage. Plots fertilized with 100 per cent RDF+bio-fertilizers recorded maximum green (329.76 q/ha) and dry (77.57 q/ha) fodder yields. This might be due to supply of required quantity of nutrients through fertilizers and also through bio-fertilizers especially *Azotobacter* fixed atmospheric nitrogen and made available to plants which is a major nutrient from forage point of view. The results are similar to the findings of Sadhu *et al.* (1990).

Economics

Net realization and B : C ratio were maximum under plots treated with conventional tillage (Table 2). This might be due to higher fodder yield under conventional tillage. Under nutrient management, application of 100 per cent RDF+bio-fertilizers recorded maximum net realization and B : C ratio. This might be due to higher fodder yield under this treatment. Among interaction effects conventional tillage along with 75 per cent RDF+Bio-fertilizers recorded maximum B : C ratio. So, conventional tillage with 75 per cent RDF+bio-fertilizers is economical. These results are similar to the findings of Verma and Dadheech (2005).

TABLE 1
Effect of tillage practices and nutrient management on yield of fodder oat

Treatment	Nutrient management									
	Green fodder yield (q/ha)					Dry fodder yield (q/ha)				
	N_1	N_2	N_3	N_4	Mean	N_1	N_2	N_3	N_4	Mean
Zero tillage	227.19	241.60	247.28	295.59	252.92	40.43	61.83	66.03	68.02	59.08
Minimal tillage	241.60	243.72	333.22	336.90	288.86	63.52	65.12	74.70	76.11	69.86
Conventional tillage	309.86	351.12	351.14	356.79	342.23	72.91	76.50	79.67	88.59	79.42
Mean	259.55	278.81	310.55	329.76		58.95	67.82	73.46	77.57	
		C. D. (P=0.05)						C. D. (P=0.05)		
Comparison of two main plots		32.10						7.36		
Comparison of two sub-plots		25.90						5.40		

TABLE 2
Effect of tillage practices and nutrient management on economics of fodder oat

Treatment	Nutrient management									
	Net realization (Rs./ha)					Benefit : cost ratio				
	N_1	N_2	N_3	N_4	Mean	N_1	N_2	N_3	N_4	Mean
Zero tillage	8365	9328	9642	13317	10163	0.85	0.93	0.95	1.29	1.01
Minimal tillage	9158	9138	16158	16262	12679	0.90	0.88	1.54	1.52	1.21
Conventional tillage	13989	17100	16961	17323	16343	1.29	1.55	1.52	1.54	1.47
Mean	10504	11855	14254	15634		1.01	1.12	1.34	1.45	
		C. D. (P=0.05)						C. D. (P=0.05)		
Comparison of two main plots		1998.12						0.17		
Comparison of two sub-plots		1734.83						0.14		

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