

## Integrated Weed and Nutrient Management Practices in Wheat+Rapeseed Intercropping System

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Intercropping is reported to suppress weeds besides increasing the productivity and monetary return of the system (Rao and Shetty, 1976). The weed suppressing ability, however, depends on the component crops, planting pattern and other cultural practices adopted (Moody and Shetty, 1981). Evidences are available to show the higher productivity and return from wheat+rapeseed intercropping system (Mandal *et al.*, 1986; Rajkhowa *et al.*, 1994). The appropriate weed and nutrient management practices may further help in realizing higher productivity and economic return of the system. Although weed management practices for sole wheat or rapeseed are available, but the information on weed management practices for wheat+rapeseed intercropping system is very much lacking. Further, combined use of inorganic and organic sources of nutrients is imperative for realising higher productivity of crops and better soil health. In cognizance of the above, the present study was undertaken to evaluate an appropriate weed and nutrient management practice for wheat+rapeseed intercropping system.

The field experiment was conducted during **rabi** 2000-01 and 2001-02 at the Research Farm of Assam Agricultural University, Jorhat. The soil of the experimental area was sandy loam, acidic (pH 5.4) with 252, 6.2 and 96 kg ha<sup>-1</sup> of N, P and K, respectively. Treatments comprised five weed control practices and four fertility management practices (Table 1). The recommended dose of fertilizer was 40 : 23 : 21 kg ha<sup>-1</sup> of N, P<sub>2</sub>O<sub>5</sub> and K<sub>2</sub>O. Vermicompost used in the experiment contained 2.2% N, 1.2% P and 1.8% K, while FYM used 0.45% N, 0.3% P and 0.4% K. Wheat (var. PBW 154) and rapeseed (var. M-27) were sown in 4 : 1 row ratio.

The major weed flora observed in the experimental field consisted of broadleaved species

like *Spilanthus paniculata* (11%), *Ageratum houstonianum* (17%), *Oxalis debilis* var. *corymbosa* (15%), *Solanum indicum* (4%), *Chenopodium album* (3%) and narrow leaved species like *Cynodon dactylon* (28%), *Setaria pumila* (6%) and *Paspallum conjugatum* (15%). Out of all these weeds, *Cynodon dactylon* emerged early and *Setaria pumila* and *Ageratum spilanthes* complex dominated the field at the later stages of the crop life.

All the weed control treatments significantly reduced the weed dry matter production compared to unweeded. Pendimethalin at 1.0 kg ha<sup>-1</sup> effectively controlled most of the weed species except *Oxalis debilis* var. *corymbosa* and *Setaria pumila*, *Ageratum spilanthes* complex emerged lately in the field. Dry land weeder used at 20 and 40 DAS was as effective as pendimethalin at 1.0 kg ha<sup>-1</sup> or pendimethalin at 1.0 kg ha<sup>-1</sup> followed by dry land weeder (40 DAS) in reducing the weed dry matter production. In general, weed dry matter production was comparatively low during 2000-01 as compared to 2001-02. Different nutrient management practices could not show any significant influence on weed dry matter production.

All the weed control practices significantly increased the yield of wheat as compared to unweeded check. Pendimethalin at 1.0 kg ha<sup>-1</sup> followed by dry land weeder (40 DAS) produced the highest yield of wheat and was at par with pendimethalin at 1.0 kg ha<sup>-1</sup> during 2000-01, while pendimethalin at 1.0 kg ha<sup>-1</sup> produced significantly higher yield of wheat over the other practices tried during the second year. All the weed control practices were at par and resulted in significantly higher seed yield of rapeseed over unweeded control in one out of two years. Use of 75% recommended dose of fertilizer alongwith vermicompost 2.5 t ha<sup>-1</sup> produced the highest yield of wheat during both

Table 1. Effect of weed control and nutrient management practices on weed growth and yield of crops

Treatment	Weed dry weight (g m <sup>-2</sup> )						Yield (kg ha <sup>-1</sup> )						Wheat equivalent yield (kg ha <sup>-1</sup> )	
	25 DAS		60 DAS		60 DAS		Wheat		Rapeseed		Wheat		Wheat	
	2000-01	2001-02	2000-01	2001-02	2000-01	2001-02	2000-01	2001-02	2000-01	2001-02	2000-01	2001-02	2000-01	2001-02
<b>Weed control</b>														
Weedy	2.9	8.4	4.7	11.3	11.20	1290	1290	1290	1290	318	109	1685	1457	
Dry land weeder (20 & 40 DAS)	2.7	6.1	3.5	8.9	1290	1370	1370	1370	1370	360	162	1759	1617	
Pendimethalin 1.0 kg ha <sup>-1</sup>	1.7	6.1	3.6	8.9	1266	1620	1620	1620	1620	338	172	1701	1905	
Pendimethalin 1.0 kg ha <sup>-1</sup> + Dry land weeder (40 DAS)	1.6	6.6	3.4	8.2	1380	1410	1410	1410	1410	320	169	1777	1690	
LSD (P=0.05)	1.0	1.0	1.1	1.0	192	180	180	180	180	NS	52	NS	280	
<b>Nutrient management</b>														
Recommended fertilizer (RF)	2.9	5.9	3.9	10.6	1251	1350	1350	1350	1350	322	177	1679	1643	
75% RF+Vermicompost 2.5 t ha <sup>-1</sup>	3.1	6.1	3.9	10.2	1347	1770	1770	1770	1770	339	178	1874	2066	
75% +FYM 2.5 t ha <sup>-1</sup>	2.7	6.4	3.3	9.3	1206	1370	1370	1370	1370	342	154	1829	1625	
Vermicompost 2.5 t ha <sup>-1</sup>	2.5	6.3	3.5	9.0	1065	1340	1340	1340	1340	323	136	1593	1565	
50% RF+FYM 5 t ha <sup>-1</sup>	2.7	6.8	3.6	10.1	1349	1270	1270	1270	1270	345	173	1678	1557	
LSD (P=0.05)	NS	NS	NS	NS	172	210	210	210	210	NS	NS	242	300	

NS-Not Significant.

the years of study. The yield obtained from the treatments receiving 75% recommended fertilizer with 2.5 t ha<sup>-1</sup> FYM or 50% recommended fertilizer with 5 t ha<sup>-1</sup> FYM was comparable to that of recommended fertilizer. The seed yield of rapeseed did not vary significantly due to different nutrient management practices tried. Wheat equivalent yield varied significantly due to weed control practices in one year. The highest wheat equivalent yield was obtained due to pendimethalin at 1.0 kg ha<sup>-1</sup> and the lowest was recorded in unweeded control. Among the nutrient management practices, the highest wheat equivalent yield was recorded in the treatment receiving 75% recommended fertilizer alongwith 2.5 t ha<sup>-1</sup> vermicompost and was comparable to recommended fertilizer during the first year, while during the second year, use of 75% recommended fertilizer with 2.5 t ha<sup>-1</sup> vermicompost resulted in

significantly higher wheat equivalent yield over the other nutrient management practices tried. Vermicompost 2.5 t ha<sup>-1</sup> alone recorded the lowest wheat equivalent yield.

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