



A SCIENCE AND TECHNOLOGY NEWSLETTER

NATURAL RESOURCE MANAGEMENT

Resource conservation through organic input management

In a study at Dehra Dun on a gentle slope (2%), wheat yield was found higher (2.24 tonnes/ha) in T_4 treatment [farmyard manure + vermi compost + poultry manure + minimum tillage + 3 live-mulches + palmarosa as a vegetable barrier] than T_1 treatment [organic amendments + conventional tillage + panicum; 1.38 tonne of wheat/ha]. Maize yield in T_4 increased by 21.6% against 1.85 tonnes/ha of T_1 .



Minimum tillage, weed-live mulch, organic amendments and palmarosa vegetative barrier for slope reduction and silt deposition

in the sub-surface layer (15-30 cm) was found lower than the critical level (0.6 ppm) in T_1 and T_2 . Bulk density decreased in T_2 , T_3 and T_4 (conservation agriculture treatments), which increased basic infiltration rate. Annual carbon sequestration potential (CSP) was maximum in T_4 and was minimum in T_2 .

It has been observed that combination of organic amendments, minimum tillage, live-mulches and palmarosa

Maize (2011) and wheat (2010-11) grain yield, runoff and soil loss, moisture conservation, carbon sequestration potential and net returns from maize-wheat crop rotation

Treatments	Yield (tonnes/ha) Maize	Yield (tonnes/ha) Wheat	Runoff (%)	Soil loss (tonnes/ha)	Moisture conservation in the profile (mm)	Annual carbon sequestration potential (kg/ha)	Fodder yield (tonnes/ha)/ Oil* (kg/ha)	Net returns from crop cycle (₹ per tonne)
T_1	1.85	1.38	24.2	3.86	33.4	0.84	1.77	3,080
T_2	1.48	1.67	22.5	3.12	38.6	0.76	0.37*	1,707
T_3	1.72	1.84	20.4	2.94	45.8	1.26	4.5*	2,886
T_4	2.25	2.24	18.2	2.46	63.8	1.34	5.2*	4,410

Soil moisture conservation up to the depth of 60 cm was 91% higher in T_4 due to organic amendments and weed-live mulches than T_1 . T_4 also showed reduction in runoff and soil loss (24.8 and 36.3%) compared to T_1 . Combination of palmarosa vegetative barrier with weed-live mulches has been found effective in reducing soil losses. Changes in soil properties indicated that available N and K were depleted from the initial value in all the treatments, excepting T_4 . Of the micronutrients, only Zn content

vegetative barrier treatment (T_4) yielded 9% higher wheat equivalent yield and 43.2% more economic returns per tonne of soil loss from crop cycle than conventional inorganic farming (T_1) after four cropping cycles.

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