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Short Note

Organic seed production technology and storage material for wheat seed

R. K. Kataria, Satish C. Sharma and J. K. Sharma
Seed Production Unit
CSK Himachal Pradesh Krishi Vishvavidyalaya, Palampur – 176 062.

With the awareness to control environmental pollution and improve food quality, efforts are being made to balance modern farming by using natural organic compounds as manure and protection measures for pest and diseases which are of utmost importance in the present scenario. This can save soil/ environment and crop products from further degradation by reducing pollution among mankind and ecosystem. To conserve and optimize the use of natural resources with profitability as a guiding factor of sustainability, farming systems have to be redesigned. The organic farming protocols could accentuate and aid in imparting momentum to biodynamic of field crops and seed production. Keeping in view these factors, an experiment was formulated under All India Coordinated Research Project on Seed Technology for different locations in the country to study the effect of different organic manures, seed treatments and storage materials on production and storage of wheat seed.

The field experiment with seven treatments comprising three organic manures (FYM @ 10 t/ha, vermicompost @ 20 t/ha and green manure @ 10t/ ha), two seed treatment levels (no seed treatment and seed treatment with *Trichoderma* @ 2.5g /kg seed) and one control (recommended cultural practices with full NPK, seed treatment and plant protection measures without FYM) was conducted at the research farm of Seed Production Unit, CSK Himachal Pradesh Krishi Vishvavidyalaya, Palampur situated 32.6°N and 76.3° E at an elevation of 1291 m above mean sea level during *Rabi* 2004-05. In-situ green manuring treatment in the form of *dhaincha* was applied one and a half month before sowing of the crop, whereas well decomposed FYM and vermicompost were applied at the time of field preparation for sowing of wheat.

The soil of the experimental site was silty clay loam in texture and acidic in reaction (pH 5.8) having 0.73% organic carbon, medium in available nitrogen (290.0 kg/ha) and phosphorus (13.8 kg/ha) and high in available potash (312.0 kg/ha). Wheat variety HPW 184 was sown on December 4, 2004. The raw seed was processed using Agro saw (Junior) seed grader. Graded seed yield, percentage of graded seed recovery and other quality parameters were recorded. The seedling length was measured on 8th day after soaking as per standard procedure. Seed vigour index was worked out by multiplying seed germination percentage by the seedling length. Protein content was calculated by multiplying nitrogen in seed by 6.25. Storage studies were conducted from June to December, 2005 with 21 treatment combinations comprising three types of storage material (cloth bag, cloth bag with neem leaves and polylined cloth bag) and seven field treatments. Moisture content and germination of stored seeds were recorded at regular intervals up to 6th month. The experiments were laid out in randomized block design with three replications.

Results of the study revealed that significantly higher raw (unprocessed) and graded (processed) seed yield were recorded in 100% NPK application treatment over organic manures (Table 1). FYM and vermicompost while remaining at par with each proved their superiority over green manure by producing significantly higher seed yield. However 100% NPK and different organic manures did not influence recovery and germination percentage, protein content and hectoliter weight of seed. Seedling length with 100% NPK application was observed to be significantly higher over all organic manures. However, vigour index was significantly higher under FYM + *Trichoderma* and 100% NPK over all other combinations of manures and seed treatment. Seed

Table 1. Effect of different treatments on seed yield and seed quality of wheat

Treatment	Raw seed yield (q/ha)	Graded seed yield (q/ha)	Recovery (%)	Seed quality parameters				
				Seedling length (cm)	Germination (%)	Vigor index	Protein content (%)	Hectoliter weight (g/l)
100% NPK + Seed treatment with recommended chemicals	22.3	21.40	96.0	20.6	96.7	1985.3	10.05	875.3
FYM (without seed treatment)	18.45	17.85	96.7	19.8	94.0	1863.7	9.96	868.1
FYM + Seed treatment with *Trichoderma.*	19.15	18.40	96.1	19.8	95.3	1890.7	9.85	885.2
Vermicompost (without seed treatment)	18.85	18.00	95.5	19.5	95.0	1848.3	9.63	872.6
Vermicompost + Seed treatment with *Trichoderma.*	19.10	18.30	95.8	19.8	94.3	1864.0	9.74	869.9
Green manure (without seed treatment)	14.90	14.20	95.3	19.1	96.7	1844.7	9.59	865.8
Green manure + Seed treatment with *Trichoderma.*	15.75	14.90	94.6	19.3	96.3	1854.7	9.84	872.5
CD (P=0.05)	2.75	2.85	NS	0.6	NS	39.52	NS	NS

treatment with *Trichoderma* did not influence yield and other quality parameters.

Results of storage studied did not show any beneficial effect of neem on moisture content and germination of seed at different intervals (Table 2). However, moisture content and germination of the seed were affected significantly by storage material. Polylined cloth bags were found to be superior as compared to simple cloth bags. Significantly less moisture and more germination percentage were recorded for the seed samples taken from polylined cloth bags till the end of the experiment. Field treatment did not influence moisture and germination percentage. The results are in conformity with the findings of Verma *et al.* (1993), Paul *et al.* (1992) and Dwivedi and Shukla (1990).

Table 2. Effect of storage material and field treatments on moisture content (%) and germination (%) of wheat seed during storage (June to December, 2005)

Treatments	Moisture content (%) Months of storage				Germination (%) Months of storage			
	Initial	2	4	6	Initial	2	4	6
A) Storage material								
Cloth bag	11	12.3	14.73	15.13	95.4	91.1	84.2	80.1
Cloth bag with neem leaves	11	12.3	14.66	15.18	95.3	91.0	84.1	80.0
Polylined cloth bag	11	11.3	11.44	11.69	95.7	91.6	89.7	86.5
CD (P=0.05)	NS	0.04	0.40	0.34	NS	NS	0.38	0.35
B) Field treatments								
100% NPK + Seed treatment with recommended chemicals	10.3	11.3	13.63	14.08	96.7	91.2	86.0	82.2
FYM (WST*)	10.3	11.3	13.51	14.06	94.0	90.8	85.9	82.3
FYM + STT**	10.3	11.3	13.61	14.17	95.3	91.4	85.9	82.0
Vermicompost (WST)	10.3	11.3	13.63	14.09	95.0	91.1	86.0	82.3
Vermicompost + STT	10.3	11.4	13.64	14.10	94.3	91.0	86.0	82.2
Green manure (WST)	10.3	11.2	13.60	14.09	96.7	91.2	85.9	82.2
Green manure + STT	10.3	11.4	13.66	14.12	96.3	91.1	86.2	82.1
CD (P=0.05)	NS	NS	NS	NS	NS	NS	NS	NS

*WST = Without seed treatment, **STT = Seed treatment with *Trichoderma*

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