International Journal of Plant Sciences, **Vol. 3 No. 2 : 554-555 (July, 2008)**

Effect of organic nutrition on grain shattering and seed dormancy of basmati rice under upland eco-system

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(Accepted : May, 2008)

SUMMARY

An experiment was conducted during *kharif* season of 2004 with an objectives to assess the effect of organic nutrition on grain shattering and seed dormancy of scented rice under upland eco-system. The results reveale that application of recommended dose of fertilizer through inorganic source has produced significantly at par grains per panicle with nutrient application treatment *viz.* neem cake (2.5 t/ha), FYM (10 t/ha), green leaf manuring (GLM) with *Glyceridia* (10 t/ha), FYM (5 t/ha) + biofertilizer, GLM (5 t/ha) + biofertilizer and FYM (5 t/ha) + GLM (5 t/ha) + Biofertilizer. The shattered grains/panicle and per cent shattered grains were significantly less in the treatment RDF but it was comparable with organic nutrient application of FYM (10 t/ha), GLM (10 t/ha) and FYM (5 t/ha) + GLM (5 t/ha) + biofertilizers. Filled grain (%) were influenced significantly, but seed dormancy at harvest 1, 2 and 3 weeks after harvest were not influenced significantly because of inorganic and organic nutrition.

Key words : Grain shattering, Seed dormancy, Scented rice, Upland ecosystem, RDF, FYM, Biofertilizer.

Organic farming is one of the most widely practiced, diversified conventional farming system to minimize off-farm agriculture input to the maximum extent (Lapkin, 1990). Grain shattering reduces harvestable yield. Low shattering at harvest and post harvest operations are preferred to minimize the losses due to grain shattering. The seed dormancy for short-period (2-3 weeks) is desirable trait to check seed germination before harvest when the grains are still attached to panicle and thereby result in the spoilage of the produce. Seed dormancy period assessed was based on percentage of seed germination at harvest and, therefore, at weekly interval until 80 per cent germination was attained.

MATERIALS AND METHODS

A field experiment was conducted during *kharif* 2004 at Upland Paddy Research Scheme, Marathwada Agricultural University, Parbhani. Experimental site was low in available nitrogen (270 kg/ha), medium in available phosphorus (23 kg/ha) and fairly rich in available potassium (351 kg/ha). The soil of experimental plot was vertisol with pH 8.1 and organic carbon 0.65 per cent. The experiment was laid out in randomized block design with ten treatments replicated thrice. The treatment details are T_1-control, T_2- RDF (80 : 50 : 50 kg NPK/ha), T_3-vermicompost (2.5 t/ha), T_4- Neem cake (1.5 t/ha), T_5-biofertilizers (*Azotobactor* 1.5 kg/ha + PSB 5 kg/ha), T_6- FYM (10 t/ha), T_7-green leaf manuring (GLM) with *Glyricidia* (10 t/ha), T_8-FYM (5 t/ha) + biofertilizers (*Azotobacter* + PSB), T_9-GLM (5 t/ha) + biofertilizers (*Azotobacter* + PSB) and T_{10}- FYM (5t/ha) + GLM (5 t/ha) + biofertilizer (*Azotobacter* + PSB).

Rice variety Basmati 370 was sown by drilling method with row to row spacing of 30 cm having plot size 6 x 5.4 m^2. The recommended fertilizer dose of 80 kg N, 50 kg P_2O_5 and 50 kg K_2O per hectare was used. The fertilizer dose was applied as per the treatment schedule. Fifty per cent nitrogen and entire P_2O_5 and K_2O were applied as basal and remaining dose of nitrogen was given in two equal splits that is at tillering and panicle initiation. Urea (46% N), single super phosphate (16% P_2O_5) and muriate of potash (60% K_2O) were used as carriers of nutrient for NPK, respectively, FYM (0.5% N, 0.2% P and 0.5% K) vermicompost (0.70 N, 0.3% P and 0.8% K), neem cake (5.2% N, 1.0% P and 1.4% K) was applied at sowing. Biofertilizers that is *Azotobacter* @ 1.5 kg/ha and phosphate solubilizing bacteria (PSB) @ 5 kg/ha were applied to seed before sowing. Green leaf manuring of *Glyricidia* (2.9% N, 0.5% P and 2.8 % K) were applied to soil 21 DAS. The assessment of grain shattering was done at three stages *i.e.* 25, 30 and 35 days after 50% flowering by stimulated grain shattering method (dropping the panicle horizon tally into plastic tray from 100 cm height). The intensity of seed dormancy assessed was based on induced germination of seed at maturity after heat treatment (to break dormancy) prior to germination test. The germination percentage was determined at harvest 1, 2 and 3 weeks after harvest to attend 80% germination.

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