

## **RECYCLING OF ORGANIC WASTES BY VERMICOMPOSITING AND ITS UTILIZATION IN AGRICULTURE IN HIMACHAL PRADESH**

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Lantana is one of the most problematic shrubs which has invaded vast areas and is one of the major menaces of cultivated and non-cultivated lands of H.P. and Himalayan regions of the country. Being poisonous, this shrub has no fodder value, but it makes available huge nutrient rich succulent biomass, which can be effectively utilized as green manure or raw material for vermicomposting (used in present study) which is an easy and cheap technique to utilize obnoxious shrub like Lantana and other decomposable organic wastes.

Vermicompost is a mixture of excreta of earthworms, organic material including humus, live earthworms, their eggs and cocoons and other organisms. In this project, we have found that vermicompost prepared from Lantana green twigs and leaves (collected before flowering) in combination with fresh cow dung, was ready for use within a period of 6-7 weeks. At the harvesting stage, it becomes granular, dark brown, odourless crumbly powder. The nutrient composition of vermicompost was higher than its substrates i.e. Lantana and fresh cow dung. It has higher N content (2.5%) and Fe content (0.68%) than FYM (1.4%N and 0.23% FeO) and at par with FYM with respect to rest of macro and micro nutrients.

For agronomic testing of vermicompost, field experiments were conducted for two years in maize-wheat cropping sequence with maize as the main test crop and to see the residual effect of different treatments wheat crop was taken after maize crop in the same field. The two years study revealed that grain yield of maize increased significantly with graded doses of NPK fertilizer along with vermicompost or FYM @ 10t./ha. Grain yield of maize obtained with 50 NPK fertilizer along with vermicompost or FYM was at par with that of 100% NPK fertilizer alone. Similar is the case with nutrient uptake by maize crop. Vermicompost and FYM were equally effective in increasing grain yield and nutrient uptake in maize crop. Increasing levels of NPK fertilizer resulted in increasing available NPK in soil and application of organic manure had favourable effect in increasing available NPK status of soil.

Application of organic manure i.e. vermicompost or FYM along with fertilizer NPK had beneficial residual effect in increasing yield, uptake of nutrients in wheat crop as well as available nutrient (NPK) in soil. The best treatment i.e. 50% NPK fertilizer along with vermicompost @ 10t./ha was tested in farmers fields. Vermicompost was prepared in farmers fields itself.

The main aim of the project was to utilize the waste materials and obnoxious shrubs like Lantana, which are creating health hazards by polluting soil, water and environment so by preparing vermicompost; this problem can be solved resulting into clean environment and valuable organic manure. This organic manure is helpful in increasing fertilizer use efficiency, soil fertility and hence crop productivity. From this study, we have concluded that by vermicomposting, we can utilize all types of decomposable organic waste viz. obnoxious shrubs and weeds, for wastes, dairy wastes, city wastes, kitchen wastes etc. to produce valuable organic manure within a period of 6-7 weeks. Hence in the scarcity of FYM vermicompost is the better substitute. Vermicomposting technique gives double benefits, i.e. it helps in cleaning the environment and saves the chemical fertilizer. The use of vermicompost @ 10t./ha to maize crop saves NPK fertilizer, the costly input by 50% in a maize wheat cropping system.