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Utilization of Poultry Litter as Organic Manure in Manipur

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Introduction

Poultry farming in Manipur is a fast growing industry in which poultry farming is in large or small scale. The people of Manipur both in the urban and rural areas are familiar with the rearing of poultry and the utilization of the poultry litter as organic manure is practice in Manipur. Uncontrolled and excessive use of chemical fertilizers and pesticides for increasing yield in agriculture has become a major problem in Manipur. Utilization of the poultry litter as manure for the plant as one of the best alternatives for chemical fertilizer as it is high in nitrogen (N) phosphorus (p) potassium (k) and other essential nutrient It aids in addition of organic manure to the soil which improve the soil structure, aeration, water holding capacity water infiltration. Chicken litter is the waste generated in the largest quantities in the process. Chicken litter is a mixture of chicken faces, feathers, bedding materials and spilt feeds, drugs, and water (Sanchuki et al.,2011). Almost every household in the rural area's rear poultry mostly for egg and meat for their own household in a small scale and therefore utilization of the poultry litter as manure for the plant is as important as raising the poultry for the egg or meat. Proper management and collection of the faeces of the poultry and proper storage is necessary. Proper covering of the stored faeces will reduce in the amount of nutrient loss. There are several ways in which poultry manure can be collected and processed. Several factor such as operation size, climate, animal type etc. will determine what type of system is used in what kind of circumstances. It should be noted that in many instances, the strongest influence on which system is used is the economics (costs) of the system. Each system has its own merits and costs, but careful consideration must be used in order to select a system which will make the most efficient use of the factors in which it will be operated.

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Why is the utilization of Poultry litter very successful in Manipur?

1. **Composition of the Poultry litter:** Soil Fertility is totally based on the presence of soil nutrients in the soil and poultry manure prepared from the poultry litter is very rich in nitrogen (N), phosphorus (P), potassium (K). It is using as organic farming particularly for nitrogen deficit soil, the remaining nitrogen is release gradually when organic wastes disintegrate which may take more than one growth season (Hartz et al.,2000). The easy availability of the required soil nutrients makes is very convenient for the poultry farm owners to utilize the poultry litter as an option for organic manure. Poultry manure contains all the essential plant nutrients that are used by plants. These include nitrogen (N), phosphorous (P), potassium (K), calcium (Ca), magnesium (Mg), sulphur (S), manganese (Mn), copper (Cu), zinc (Zn), chlorine (Cl), boron (B), iron (Fe) and molybdenum (Mo) (Amanullah et al.,2010). It can be an alternative for chemical fertilizer due to its high nutrient control and very low cost. Chicken fertilizer may improve soil structure and hence boost water penetration rates.
2. **Easy preparation methods :** Processing of poultry manure is needed to prevent rapid decomposition and loss of nutrients (Muller., 1984) and drying of the litter has improve the physical characteristics of the poultry manure (McNeill *et al*., 1980; Kroodsma., 1985). The poultry litter is prepared in a composting pit, and aerobic composting is done (Kumar *et al*.,2007). The floor of the compost bin is made up of concrete slabs and the side walls of the compost bins are made up of wooden plank. An air space is provided between wooden planks for the purpose of aeration to compost piles. These bins are arranged under roofed shed to protect the bins from entry of rainwater.Farm yard manure is utilized as manure substrate and Paddy straw (*Oryza sativa*) and sorghum hay (*Sorghum bicolor*) are used as added carbon source. The moisture content is kept as 60% by adding sufficient water over the compost materials. The compost bins are opened when the bin temperature is below 40°C (primary stage) and the content is mixed thoroughly, remoistened and aerated and filled again for secondary stage heating. When the second heating cycle is completed, the compost materials are moved to a storage yard. pH is an important factor of the soil fertility and litter can also have an impact on soil pH and liming due to varying amounts of calcium carbonate in poultry feed.

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3. **Improves soil physical properties:** Physical properties of the soil is a very important factor for agriculture practices and poultry manure application have improved the physical properties of the soil. It significantly decreases bulk density and increases total porosity, infiltration capacity and water holding capacity (Mbagwu.,1992). Soil physical properties such as bulk density, water holding capacity and percent water stable aggregation were noted to be favorably influenced by poultry waste addition to soil (Weil and Kroontje.,1979). Poultry litter is used as an organic manure as it contains a considerable amount of organic matter due to the manure and the bedding material (Mullens *et al*.,2002). Poultry manure improved soil physical properties significantly by reducing soil bulk density and temperature and increasing total porosity and moisture content**.** The improvement in soil physical properties have made utilization of poultry litter as organic manure very successful in Manipur as it reduces the requirement of commercial fertilizers and at the same time conserve the soil health.

Conclusion:

Manipur is economically backward when it comes to the farmers source of income. Most poultry farmers are from economically backward classes and the idea of waste management of the poultry litter is an interesting step to improve the soil quality without any procurement of other fertilizers. Application of Poultry manure in the soil improves the soil quality in physical, chemical and biological properties at a very low or almost zero cost. It is easily accessible and available when needed by the farmer to use the manure whenever required. It enhances the soil quality thereby improving the growth of the plant overall. It helps the farmer in the rural areas of Manipur as most of them cannot afford expensive chemical fertilizer. Poultry litter is an easy source for rural poor to manage the environmental hazards cause by the dead poultry, their waste material and also prevents its contribution to harmful environmental factors.

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