ORGANIC MANURE MAKING

Project report submitted in partial fulfilment of the requirements for the award of the certificate of

MASSIVE OPEN ONLINE COURSE

On

ORGANIC FARMING

Submitted to

MAHATMA GANDHI UNIVERSITY, KOTTAYAM

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CERTIFICATE

This is to certify that Project report entitled "**Organic Manure Making**" is submitted in partial fulfillment of the requirements for the award of the certificate of **Massive Open Online Course** on **Organic Farming** is a report of bona fide project work carried out by **ALTO B PUTHETHU [200021090632]** of **"Bachelor of Computer Applications", Mahatma Gandhi University, Kottayam during the year 2020-2023.**

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ABSTRACT

Soils rarely have sufficient nutrient for crops to reach their potential yield. Applying organic fertilizers without prior knowledge of their properties may cause yield decline under low application or pollute the environment with excessive application. Understanding the nutrient variability and release pattern of organic fertilizers is crucial to supply plants with sufficient nutrients to achieve optimum productivity, while also rebuilding soil fertility and ensuring protection of environmental and natural resources. This chapter presents the authors' experiences with different organic amendments under Hawaii's tropical conditions, rather than an intensive literature review. For meat and bone meal by-products(tankage), batch-to-batch variability, nutrient content/release pattern and quality, and plant growth response to the liquid fertilizer produced from tankage were evaluated. For animal livestock, dairy manure (DM) and chicken manure (CM) quality, changes in soil properties, and crop biomass production and root distributions were evaluated. For sea weed, an established bio-security protocol, nutrient, especially potassium(K)variability, and plant growth and yield response were evaluated in different tropical soils manure and biochar amendments have been used in agriculture to improve soil fertility and enhance crop productivity. Plant roots play an important role in the functionality of individual plants, and although the addition of organic manure and biochar reportedly affect roots, it remains unclear how root morphology and physiology respond. We conducted a field experiment to test the hypothesis that organic manure combined with biochar amendment could also enhance the productivity of continuous cropping systems in Xinjiang cotton plantations. Different levels of organic manure and biochar were applied. Organic manure and biochar significantly affected root morphology and physiology by improving soil nutrients. In the absence of biochar, organic manure amendment increased Root TTC reducing capacity, glutamine synthetase and nitrate reductase activity. Furthermore, morphological and physiological parameters peaked with 6% organic manure combined with 1% biochar. A significant increase in root physiology was recognized with an increase in soil nutrient content at the bud stage and a negative relationship between root physiology and soil total K content at the harvesting stage. Thus, our results indicate that organic manure combined with biochar

positively influenced cotton roots, and therefore should be used to improve root health in continuous cropping systems. A significant increase in root physiology was recognized with an increase in soil nutrient content at the bud stage and a negative relationship between root physiology and soil total K content at the harvesting stage. Thus, our results indicate that organic manure combined with biochar positively influenced cotton roots, and therefore should be used to improve root health in continuous cropping systems. A significant increase in root physiology was recognized with an increase in soil nutrient content at the bud stage and a negative relationship between root physiology and soil total K content at the harvesting stage. Thus, our results indicate that organic manure combined with biochar positively influenced cotton roots, and therefore should be used to improve root health in continuous cropping systems.

INTRODUCTION

Manure is organic matter that is used as organic fertilizer in agriculture. Most manure consists of animal feaces other sources include compost and green manure. Manures contribute to the fertility of soil by adding organic matter and nutrients such as nitrogen that are utilized by bacteria, fungi and other organisms in the soil. Higher organisms then feed on the fungi and bacteria in a chain of life that comprises the soil food web. According to a Byzantine tradition attributed to Cassian pig dung was generally not usable as fertilizer except for almond trees. Similar views recorded by Columella were unrelated to the Islamic taboos of later centuries, though the negative effects of pig dung "burning" plants. Ibn Bassal described a sort of mixed manure with sweeping mixed in as mud of, implying that was not composed of only manure. The sweepings from hot baths included urine and human wastes, which Ibn Bassal describes as dry and salty, unsuitable for use as fertilizer unless mixed with manure. Ibn Bassal gives two recipes for composting pigeon (hamam) and possibly donkey (himar) manure, though the translation is uncertain. Bassal says the excessive heat and moist qualities of pigeon dung worked well for weaker and less hardy plants, especially those affected by cold temperatures Sustainable and organic agriculture practices apply management ideals that include a diverse assembly of farming methods, usually with a reduced reliance on purchased inputs, this is especially for new farmers with limited resources. As commercial fertilizer/shipping costs increase, a wide range of food producers in the Hawaii and the Pacific region have realized the need for locally available fertilizers from organic sources to improve soil fertility, crop health, and productivity. In addition to concerns surrounding availability of affordable soil amendments, interest in sustainability and organically produced crops has risen among American consumers in the past few decades. Increased tourism has further amplified the need for fresh local fruits and vegetables, especially “locally grown” labelled goods. Shifting from conventional farming to organic farming has many benefits to the human's well-being, protecting the environment (soil, water, and air), rebuilding soil fertility through improving its physical, chemical, and biological characteristics, and improving the quality of produced crops. However, producing crops organically may come with higher production costs (i.e., lower yield and higher labour cost).

Recycling, composting, and using local inputs may decrease the production cost. In general, soils rarely have sufficient nutrients available for crops to reach their potential yield. Therefore, farmers tend to apply soil amendments (synthetic or organic amendments) that are rich in nutrient, i.e., N, P, and K to enhance soil fertility and increase crop productivity. However, most growers apply fertilizers based on the general recommendations for each crop, without prior knowledge of the soil fertility status and nutrient mineralization and release pattern from the fertilizer. In addition, Hawaii farmers face the continuous challenge of declining soil organic matter (SOM) and fertility due to the optimum environmental condition (e.g., temperature and rainfall) for SOM decomposition. These losses are more critical with the use of organic amendments, where nutrients have to be converted from organic to inorganic forms in order to be available for plant uptake. Also, rebuilding/restoring soil fertility and improving the physical, chemical, and biological function of soils are critical to support optimal plant growth, yield, and quality. Sustainable health of the soil relies on carbon-rich amendments that will feed the biological processes that are the core foundation of a healthy soil. Short- term needs must also be met with fertilizers that rapidly become available to plants, so that nutrients are available in synchrony with plant needs. In Hawaii, there are many locally available resources to meet both long- and short-term crop nutrient and soil function needs when used properly. Improving farmers' knowledge and their capacity to determine the quality of different fertilizers and soil and crop's needs are essential elements in organic agriculture. This chapter focuses on the authors' experiences with certain organic fertilizers that are available in Hawaii rather than being an extensive review of them. The crop removes large quantity of plant nutrients from soil, particularly the removal of NPK nutrients at the present level of crop production has been estimated at 125 kg/ha/annum whereas the annual addition is not more than 75 kg resulting in depletion of the nutrient reserve of soil. The excessive reliance on chemical fertilizers and the negligence shown to the conservation and use of organic sources of nutrients have not only caused the exhaustion of soil of its nutrient reserves but also resulted in soil health problems not conducive to achieving consistent increase in agricultural production. Moreover, Indian soils are poor in organic matter and in major plant nutrients. Soil organic matter is the key to soil fertility and productivity. In the absence of organic matter, the soil is a mixture of sand, silt and clay. Organic matter induces life into this inert mixture and promotes biological

activities. Although the beneficial influence of organic matter on the physical, chemical and biological properties of the soil is widely known, the full appreciation of the same remains largely ignored in modern agriculture. The regular recycling of organic wastes in the soil is the most efficient method of maintaining optimum levels of soil organic matter. Recycling of organic matter in the soil should become a regular feature of modern agriculture. In the traditional agriculture, followed over generations in India, the use of plant and animal wastes as a source of plant nutrient was the accepted practice. The importance and aim of organic manures and green manure crops have failed to be recognized in modern agriculture.

TYPE OF MANURE

ANIMAL MANURE

Most animal manure consists of feces Common forms of animal manure include farmyard manure (FYM) or farm slurry (liquid manure) FYM also contains plant material (often straw), which has been used as bedding for animals and has absorbed the feces and urine Agricultural manure in liquid form, known as slurry, is produced by more intensive livestock rearing systems where concrete or slats are used, instead of straw bedding. Manure from different animals has different qualities and requires different application rates when used as fertilizer. For example, horses, cattle, pigs, sheep, chickens, turkeys, rabbits, and guano from seabirds and bat s all have different properties. For instance, sheep manure is high in nitrogen and potash, while pig manure is relatively low in both. Horses mainly eat grass and a few weeds so horse manure can contain grass and weed seeds, as horses do not digest seeds the way that cattle do. Cattle manure is a good source of nitrogen as well as organic carbon. Chicken litter, coming from a bird, is very concentrated in nitrogen and phosphate and is prized for both properties. Animal manures may be adulterated or contaminated with other animal products, such as wool (shoddy and other hair), feathers, blood, and bone. Livestock feed can Be mixed with the manure due to spillage. For example, chickens are often fed meat and bone meal, an animal product, which can end up becoming mixed with chicken litter.

COMPOST

Compost is a mixture of ingredients used to fertilize and improve the soil. It is commonly prepared by decomposing plant and food waste and recycling organic materials. The resulting mixture is rich in plant nutrients and beneficial organisms, such as worms and fungal mycelium Compost improves soil fertility in gardens, landscaping, horticulture, urban agriculture and organic farming. The benefits of compost include providing nutrients to crops as fertilizer, acting as a soil conditioner, increasing the humus or humic acid contents of the soil, and introducing beneficial colonies of microbes that help to suppress pathogens in the soil. It also reduces expenses on commercial chemical fertilizers for recreational gardeners and commercial farmers alike. Compost can also be used for land and stream reclamation, wetland construction, and landfill cover.

GREEN MANURE

Green manure are crops grown for the express purpose of plowing them in, thus increasing fertility through the incorporation of nutrients and organic matter into the soil. Leguminous plants such as clover are often used for this, as they fix nitrogen using Rhizobia bacteria in specialized nodes in the root structure.

Other types of plant matter used as manure include the contents of the rumens of slaughtered ruminants, spent grains and seaweeds.

MATERIAL USED

- Coconut husk
- Kitchen waste (vegetables)
- Soil
- Dry tree leaves
- earthen pot

USES OF ORGANIC MANURE

Animal manure, such as chicken manure and cow dung, has been used for centuries as a fertilizer for farming. It can improve the soil structure (aggregation) so that the soil holds more nutrients and water, and therefore becomes more fertile. Animal manure also encourages soil microbial activity which promotes the soil's trace mineral supply, improving plant nutrition. It also contains some nitrogen and other nutrients that assist the growth of plants. Odour is an obvious and major issue with manure. Components in swine manure include low molecular weight carboxylic acids, acetic, propionic, butyric and valeric acid. Other components include skatole and trimethyl amine Manures with a particularly unpleasant odour (such as slurries from intensive pig faming are usually knifed (injected) directly into the soil to reduce release of the odour. Manure from pigs and cattle is usually spread on fields using a manure spreader. Due to the relatively lower level of proteins in vegetable matter, herbivores manure has a milder smell than the dung of carnivores or omnivores. However, herbivore slurry that has undergone 10 anaerobic fermentations may develop more unpleasant odours, and this can be a problem in some agricultural regions. Poultry droppings are harmful to plants when fresh, but after a period of composting are valuable fertilizers. Manure is also commercially composted and bagged and sold as a soil amendment. In 2018, Austrian scientists offered a method of paper production from elephants and cow manure dry animal dungs is used as a fuel in many countries around the world issues. Any quantity of manure may be a source of pathogens or food spoilage organisms which may be carried by flies, rodents or a range of other vector organisms and cause disease or put food safety at risk. In intensive agricultural land use, animal manure is often not used as targeted as mineral fertilizers, and thus, the nitrogen utilization efficiency is poor. Animal manure can become a problem in terms of excessive use in areas of intensive agriculture with high numbers of livestock and too little available farmland.

Livestock antibiotics

Some study indicated that foods such as corn, lettuce, and potatoes have been found to accumulate antibiotics from soils spread with animal manure that contains these drugs. Organic foods may be much more or much less likely to contain antibiotics, depending on their sources and treatment of manure. For instance, by soil association Standard 4.7.38, most organic arable faming either have their own supply of manure (which would, therefore, not normally contain drug residues) or else rely on green manure crops for the extra fertility (if any nonorganic manure is used by organic farmers, then it usually has to be rotted or composted to degrade any residues of drugs and eliminate any pathogenic bacteria—Standard 4.7.38, Soil Association organic farming standards). On the other hand, as found in the University of Minnesota study, the non-usage of artificial fertilizers, and resulting exclusive use of manure as fertilizer, by organic farmers can result in significantly greater accumulations of antibiotics in organic foods.

BENEFITS OF ORGANIC MANURE

- Increased soil carbon and reduced atmospheric carbon levels
- Reduced soil erosion and runoff
- Reduced nitrate leaching
- Reduced energy demands for natural gas-intensive nitrogen(N) fertilizers

ADVANTAGES AND DISADVANTAGES OF ORGANIC MANURE

Advantages

- In addition to releasing nutrients, it improves soil structure
- Increases water holding capacity
- Slow in action hence very difficult to over fertilize plants
- Renewable, biodegradable, eco friendly

Disadvantages

- Slow in action hence very difficult to over fertilize plants
- Renewable, biodegradable, eco-friendly.
- Slow in action, microbes required to release nutrients microbes require moisture, so seasonal variation may have effects.
- Nutrient ratios are unknown

ORGANIC MANURE MAKING STAGES







COST BENEFIT ANALYSIS

As compared to that of chemical fertilisers, organic manure is cheap and can be made at home itself. The materials used was zero cost, since cow dung, dry leaves, coconut husk, kitchen waste etc were purely from home. The organic manure formed is cheaper in cost but its beneficial effects and fertility is rich in quality.

CONCLUSION

I successfully competed my organic manure within 43 days just completed it.by adding kitchen waste every daily and ensure oxygen flow and the mix became soggy add little dry cow dung to it mix well. It just cost me around 85 rupees. The organic manures provide a way for reducing the indiscriminate use of chemical fertilizers and help to maintain the soil health with a positive impact on organic matter recycling. The liquid organic manures help to achieve higher growth and development of the crops through improved physiological and biochemical processes of the plant, as their application results in rapid availability of macronutrients, micronutrients, growth regulators and other beneficial substances to the plants in addition to enhanced tolerance to biotic and abiotic stresses. They also increase the beneficial microflora of the soil and their activity to a large extent upon soil application and thereby increase the availability of soil nutrients. These liquid organic manures are low-cost production technologies as they can be easily prepared from naturally and locally available materials by the farmers, thereby they also offer eco-friendly nature. Thus, use of liquid organic manures in agriculture plays prime role to sustain the soil fertility and crop productivity.