

POTENTIAL OF DECOMPOSED SALVINIA IN CROP PRODUCTION

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Salvinia (Salvinia molesta) is a water fern identified as a widespread weed in many parts of the country. It is commonly found in many paddy fields, irrigation canals and tanks in Colombo, Kalutara, Matara, Chilaw and also in some parts of the North Western Province. This harmful, pernicious weed affects large extents of rice fields in Sri Lanka. It produces a high volume of biomass during a comparatively short period of time due to its fast growing ability in local environmental conditions. At present, the eradication of salvinia has become a significant problem in rice cultivation in many areas of the country. Hence, the use of salvinia as an organic fertilizer would be a valuable option in solving this problem.

CHEMICAL COMPOSITION

The chemical analysis of salvinia collected from Bombuwela are pH (1:15 H₂O) 6.3; total N 0.56%; total P 0.15%; total K 0.45% and dry matter 2 – 3%. Chemical analysis indicates that salvinia contains very low amounts of plant nutrients, particularly P and K. Therefore, the use of salvinia as a source of plant nutrients will have a very low impact on crop production. Salvinia has a low pH when compared to poultry manure, cattle manure and compost prepared from other organic materials (Wijewardena, 1993; Wijewardena, 1995; Wijewardena and Yapa, 1999; Wijewardena, 2000). It suggests that decomposed salvinia has no liming effect as seen in many other organic manures used in this country.

Salvinia has a very high moisture content of about 97 – 98% i.e., about 2 – 3% dry matter. Therefore, salvinia provides low organic matter to soils. Because of the low nutrient content and low organic matter content in salvinia, a large quantity of salvinia is necessary to achieve significant yield increases in crop production.

BENEFITS

Salvinia as an organic material in soils improves the physical, biological and some chemical properties of soil. Hence, the use of salvinia is an attractive option in upland cultivation than in lowland rice cultivation. It is important to note that decomposed salvinia can increase the proportion of water-stable aggregates and increase the water-holding capacity of soil.

Salvinia is a material containing low cellulose and lignin. Therefore, it is less resistant to biodegradation, which is an important factor to be considered in the application of organic materials. Besides, salvinia is a very small plant in size and physical state, which is ideal for decomposition. No chopping is necessary and it is easy to handle. Salvinia has a low C/N ratio compared to many other organic materials. As a result, decomposition process of salvinia would be fast.

Therefore, salvinia can be used as a raw material for compost making along with other raw materials such as city wastes, crop residues, animal manures, etc. However, it should be noted that the decomposing procedure should be carried out thoroughly until salvinia decomposes completely. Otherwise, use of such compost particularly in the low lands can spread the salvinia in paddy fields and in waterways.

USE IN CROP PRODUCTION

The chemical composition of salvinia indicates that it can be used as an organic manure to improve the physical and biological properties of soil which are beneficial for crop production in upland cultivation rather than as a source of plant nutrients. Hence, decomposed salvinia should be added to crops in combination with recommended amounts of chemical fertilizers.

At present, farmers are using decomposed salvinia for crops such as vegetables, flowers, fruits and some plantation crops to a lesser extent. However, research findings are rather limited in the use of salvinia in crop production. Experiments conducted at the regional agricultural research and development center, Bombuwela reveal that it has very little effect on crop yield. However,

this does not mean that decomposed salvinia should not be utilized in crop production.

Soil degradation is an important concern today in the agricultural sector. Being an agricultural country, Sri Lanka has to pay much attention to this problem. In this context, use of organic materials in agricultural crop production is a viable option. As the freely available organic materials are limited, use of organic materials such as decomposed salvinia must be encouraged to improve the overall soil conditions for sustainable production in the agricultural sector.

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