VALUE OF RICE STRAW AS A FERTILIZER MATERIAL.

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An extent of about 800,000 hectares of rice is cultivated annually in Sri Lanka. Assuming an average paddy yield of 2.9 t/ha and assuming a ratio of 1:1 for paddy to straw, the annual production of rice straw in Sri Lanka can be estimated to be about 2.3 million tons.

Rice straw is used as a feed for cattle, as a mulch of ginger, turmeric and other crops, for the manufacture of paper, to thatch roofs of houses, and for other miscellaneous purposes. A few farmers return the straw back to the rice fields, but the most common means of disposal is to burn it at the threshing floor and allow the ash to remain there.

Rice straw contains all the nutrients required for plant growth and is particularly rich in nitrogen, potassium and silicon. The nutrient content of straw can vary depending on variety, season, crop management and the land on which the crop is grown.

Assuming straw to contain 0.6% nitrogen, 0.08% phosphorus and 1.8% potassium, 4 tons of rice straw will contain 24 kg nitrogen, 3 kg. phosphorus and 72 kg potassium. This amount of straw can be expected from a hectare of a good crop in the low country dry zone, intermediate zone or the mid-country wet zone. The above nutrient content represents about 33% of the nitrogen, 12% of the phosphorus and 200% of the pottassiumfertilizers recommended for a 3½ month rice crop grown in the above region. The amount of straw and its nutrient content will be somewhat less than above from a crop in the low country wet zone.

In spite of the fertilizing value of rice straw, very few farmers add it back to their fields. This may be because they are unaware of its value, or because it is cumbersome to bring it back to the field from the threshing floor, or because of the problems involved in its incorporation to the soil.

Rice straw can be returned to the field as straw, as straw ash, or as a straw compost. If straw is returned, tillage operations may be difficult unless the straw is fairly well decomposed. Further, decomposing straw can be harmful to the young rice plants. The degree of decomposition of straw will depend among other things, on the manner in which it is added, the time between its addition and commencement of the following season, the nitrogen content of soil, the soil moisture condition and the drainage status. Decomposition will be slow in poorly drained soils. While some farmers successfully return the straw to the field in the raw form, this method is not suitable for general application throughout Sri Lanka. Research is needed to identify methodologies of incorporating straw to suit specific local situations.

Rice straw ash is rich in potassium. Experiments have shown that it could replace muriate of potash. Many of the problems associated with the addition of straw are absent with addition of ash. However, by burning straw we loose almost all the nitrogen, sulphur and organic matter, and even some of the potassium.

Addition of straw compost will return all the plant nutrients and the organic matter in the straw to the soil, minus the problems associated with the undecomposed straw. Compost preparation generally requires straw, a low C/N material such as cattle manure, water, space and time. Some of these are not easily available to most farmers.

We have come across a method which is simple and effective and which has been successfully used by a few farmers in Kegalle District for the last several seasons. In this method the straw is returned to the liyadde after threshing and placed in a heap. The area of the base of the heap is 4 to 5 square metres and the height about 2 metres. Rice is grown on the rest of the liyadde in the usual manner. The straw heap gets moistened from the flood water of the liyadde or from rain. The straw is well decomposed when the rice crop is about to be harvested. The compost is now spread to the entire liyadde at the commencement of the next season, and the process is repeated. A disadvantage of the method is the small area lost for cultivation of rice. This however, is amply compensated by the production of valuable fertilizer by the farmer in his own field with his own raw material.

A few points need to be mentioned regarding this method. By leaving about 15 cm. of stubble at harvest time, the amount of straw removed is minimised, thereby reducing the size of the heap. As the potassium in the straw is easily leached by water, there will be a tendency to enrich the soil with potassium in the vicinity of the heap. To account for this the heap can be made at different positions in the liyadde during each season. The straw heap should be made away from the bunds to prevent invasion by rats. For the same reason straw heaps are not recommended in fields which cannot have standing water during the growth of the rice crop.

Addition of rice straw will not only add the plant nutrients to the soil but will also increase its organic matter content. The combined effect would lead to an increase in soil fertility and to high and stable rice yields. in particular it is clear that as far as the low country dry zone, intermediate zone and the mid country wet zone are concerned, there will be no need to add only muriate of potash to the rice crop if the straw is returned. Further, at least about 20 kg nitrogen per hectare can be saved per rice crop.

Several farmers are trying out the heap method of composting rice straw inYala 1981. It is hoped that this experience will be useful in adopting this practice on a national scale.

The very life of Sri Lanka depends on her rice crop. National rice production depends very heavily on the quantum of fertilizer used. In this context we cannot afford to waste or under utilize rice straw.

Part I. AGRICULTURAL EDUCATION OVER A HUNDRED YEARS

Agricultural education is nearly a hundred years old in this country. The earliest recorded activities were in the 1980s even before the Department of Agriculture was formally set up. At that time the organization that existed in Peradeniya gave its attention to the investigation of the flora of the country. Subsequently it introduced large numbers of exotics, and helped to build up the prosperous agriculture (plantation crops). It was then called upon to deal with pests and diseases of those crops. Later it made experimental investigations into the cultural and manurial requirements of the various crops began work on the improvement of existing varieties of cultivated crops and took up the furtherance of agricultural education.

In the early part of this century, agricultural education received further importance and the entire school garden movement came under the guidance and and management of the organization at Peradeniya. All pupils above standard II were expected to do at least 30 - 45 minutes work in these school gardens three times a week. The purpose of this was to train the pupil's powers of observation and to acquaint them with some of the cultivation problems in the raising of fruit trees , economic plants and ornamental plants. It was soon realised that the value of this training depended entirely upon the