

EFFECT OF MULCHING ON THE BULK DENSITY AND WATER STABLE AGGREGATES OF SOIL

The practice of soil mulching has considerable influence on soil properties and conditions. Tuvelle and Mc Calla (1961) and Ramig and Mazurak (1964) reported lower bulk density and larger water stable aggregates in soil as a result of stubble mulch tillage than clean tillage. Unger (1969) also noted higher water stable aggregation for stubble mulch treatment.

An investigation was taken up in the uplands of the Agricultural College Farm, Vellayani, Kerala, during December 1978 to May 1979, to study the effect of mulching colocasia crop on the soil characteristics. The soil of the experimental site was red loam with pH 5.4, and bulk density 1.71 g/cc. The treatments consisted of 3 practices viz., a) mulching at the time of planting, b) mulching at the time of planting and again at the time of first earthing up and c) no mulching (control). The experiment was laid out in randomised block design replicated 9 times. The net plot size was 37.8 sq. m. and the spacing 60 x 45 cm. Dried leaves were used as the mulch and applied at the rate of 37.04 t/ha. Soil upto a depth of 15 cm from the surface was collected for the study. Bulk density was determined using a core sample. Analysis of water stable aggregates was carried out by Yoder's modified wet sieving method as described by Satyanarayana *et al.* (1973). Soil aggregates larger than 0.25 mm only were taken into consideration.

The data on the bulk density and water stable aggregate content of the soil after the experiment were subjected to statistical analysis and the mean values are presented in Table 1.

Table 1
Effect of mulching on the bulk density and the water stable aggregates of the soil after the experiment.

Treatments	Bulk density (g/cc)	Water stable aggregates (%) (> 0.25 mm)
1. No, mulching	1.73	0.58
2. Mulching at planting	1.70	72.19
3. Mulching at planting and at first earthing up	1.70	73.46
CD	0.014	0.792

The effect of mulching on bulk density of the soil was found to be highly significant. Mulching, in general decreased the bulk density. Non-mulching recorded the highest bulk density while the minimum density was noticed in the case of treatments which received mulching. This is due to the improvement in soil structure by mulching. The results obtained in the present investigation is in agreement with the results of Lal (1978) who reported a higher bulk density in the un-mulched plots.

Mulching twice recorded the maximum content of water stable aggregates (73.46 per cent) followed by mulching once. For the formation of aggregates the soil particles should coagulate and flocculate and should be held together or bound together into clusters by some binding materials. Mulching the soil with leaves might have improved the organic matter status of the soil which in turn might have increased the content of water stable aggregates.

സംഗ്രഹം

കരപ്രദേശത്തു നടത്തുന്ന ചേമ്പുകൃഷിക്ക് കരിയില ഉപയോഗിച്ചുള്ള മൽച്ചിംഗ് ചെയ്യുന്നതുകൊണ്ട് മണ്ണിന്റെ സ്മൂല സാന്ദ്രതയ്ക്കും ജലത്തിൽ കലങ്ങിപ്പോകാത്തതരം മൂത്തികാ കണികകളുടെ തോതിനും എന്തു സംഭവിക്കുന്നു എന്നറിയുന്നതിനായി 1978-79ൽ വെള്ളായണിയിൽ ഒരു പരീക്ഷണം നടത്തുകയുണ്ടായി. ഈ പരീക്ഷണത്തിൽ, മൽച്ചിംഗ് മണ്ണിന്റെ സ്മൂലസാന്ദ്രത കാര്യമായി കുറയ്ക്കുന്നതായും ജലത്തിൽ അലിഞ്ഞുപോകാത്തതരം മൺകണികകളുടെ തോത് വ്യക്തമായി വർദ്ധിപ്പിക്കുന്നതായും തെളിഞ്ഞു.

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