Influence of Long-term Non-tillage Cultivation with Green Manure (Sesbania) Interseason Cropping on Soil Fertility and Corn Yield

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Summary

In order to overcome the effects caused by continuous cropping of corn and investigate the effects of summer catch crop (Sesbania as the green manure crop) on the change in soil fertility and on the late fall corn and spring corn crop, a long termexperiment on continuous cropping of corn was carried out in the experimental farm. The soil is described as belonging to Le according to the land Capability Classification System. It is a silt loam derived on mixed alluvia of schist and slate, with incomplete drainage, low in CEC and having a solum of about 60 cm.

The four years experiment showed that application of green manure (Sesbania) and corn residue to the soil increased organic matter, Mg and SiO^2 contents and CEC, but decreased the available P, K and Ca contents of the soil. The yields of latefallcorn, regardless of tillage or no-tillage, maintained above a level of 6,220 kg/ha every year, the yield of no-tillage plot was about 4% higher than that of the tillage plot. The optimum nitrate for corn was 150 kg/ha for both plots, however , theoptimum rate for tillage plot in 1994 was 200kg N/ha. The yields of spring corn, excepting those of the spring crop of 1994 which were affected by the big rain accompanying a typhoon, were in the range of 5 ,240 and 5,950 kg/ha, the no-tillage p lotgave 4-10% higher yields than the tillage plot. Nitrogen requirements for corn in the tillage plot increased with the yield, the optimum rate was about 200 kg/ha, while for the no-tillage plot it was about 150 kg/ha.

Tilling in or mulching with Sesbania cropped in between the spring and late fall corn crops could increase the yield of the following late

fall and spring corn crops, thus reduced the problem of continuous cropping of corn.

Key words: Corn, Seabania, Tillage, Non-tillage, Green manure, Soil fertility, Nitrogen efficiency.

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