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9. Soil Quality & Health

Poster Presentation

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Effect of Green Manure Crops on Soil Conditions

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I investigated how different green manure crops affect soil organic matter content, NPK content and soil condition. To investigate the effect on soil condition, I measured the changes in soil resistance and soil moisture content between the control with and without green manure crops.

The experiment involved 10 plant species sown in 11 plots with the control in triplicate.

The aim of the 10-species experiment was to see which species could be the basis for new mixtures. Quick emergence and strong weed suppression are important, because if the area is quickly weeded, the green herb cannot fulfil its role.

Sampling was done before sowing and after rotation the following spring. Soil analysis was carried out to determine the nutrients used by the green manure plants, i.e. NPK. The effect of the plants on the humus content of the soil was analysed separately.

The statistical analysis was performed using the crop sown, the depth of the measurement and the time of measurement.

the effect of the measurement time and measurement date on soil moisture content, a repeated measures model was used, using the

a least significant difference (LSD) post hoc test was used to compare means

was performed using the statistical program "R".

For oilseed radishes, NPK did not decrease after incorporation, with opposite results obtained with

buckwheat. No strong correlation was found between applied nitrogen and phosphorus,

and nitrogen and potassium, but a close correlation between the amount of potassium and phosphorus used per unit area.

When examining humus content, we conclude that butterfly weeds are the green manure crops that have increased soil organic carbon content the most. Overall, a positive effect, an increase in soil organic matter content, was observed to a lesser or greater extent for all 10 plant species studied.

In terms of soil moisture, it was found that in the spring after incorporation, all the green manured plots contained more moisture than the control plots. Soil moisture values improved at the depths tested (0-60cm), i.e.

green manures helped to maintain soil moisture. Looking at the effect on soil resistance, it can be stated that in the following year all crops showed better soil resistance values than the control in the tested layer.

Three mixtures were made of the best performing plants, a new plot experiment was set up and all tests were repeated.

One of the three mixtures had a lower biomass and took the least nutrients from the soil, the other two mixtures had a higher biomass but used more nutrients. In all cases, the soil organic matter content increased by a few percent, which means that the green manures, which took in nutrients, returned them. Again, more favourable soil moisture and soil resistance results were obtained.

The deep root penetration of green manures brings nutrients close to the surface, and green manures also have a positive effect on soil condition and help to retain moisture.

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