

PROTEIN CONTENT AND VOLUME WEIGHT OF CEREALS DEPENDING ON LEGUMINOUS PRECROP IN ORGANIC CONDITIONS

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INTRODUCTION

The aim of the trial was to diversify the selection of suitable green manure leguminous precrops and determine their influence to protein content and volume weight of followed cereal crop. The trials were carried out at the Estonian Crop Research Institute in 2011-2013.

The weather conditions of the main trial year (2013) were favourable for high yield and volume weight formation but the protein contents remained comparatively low.

MATERIALS AND METHODS

Two varieties of each cereal crop (barley, oats, rye, spring and winter wheat) were tested in 2013. The 5m² plots were sown in three replications after six different leguminous precrops in organic conditions. Precrops (sown in 2011 and 2012) were lupine, red clover, alsike clover, sweet clover, Alexandria clover (annual), crimson clover (annual) and timothy as standard.

RESULTS AND DISCUSSION

Protein content of all the cereals except winter rye, increased after all the leguminous species compared to standard. Studies by Doltra *et al* (2011) confirm that leguminous green manures have a positive effect on protein content in the organic systems. As average of all the leguminous precrops the increase of protein content was equal for oat, winter and spring wheat (1,1%) but somewhat less for barley (0,7%). The growth was low after annual Alexandria and crimson clover (respectively 0,2 and 0,3%). The maximum increase had spring wheat after alsike clover by 2,6%. As average of all the cereals the highest rise in protein content was after alsike and red clover.

The volume weight of all the cereals increased after the leguminous precrops as average by 2,0 to 5,5%. Increase of volume weight was recorded also by L. Talgre (2013). The highest increase had rye and oat. The extent of increase in volume weight was different after legume species.

As average of cereals the highest growth had after alsike clover by 4,2%. The effect of red clover was the lowest among the precrops.

CONCLUSIONS

Alsike clover increased protein content and volume weight the most as average of all the cereals. The lowest effect to protein content had annual clovers and to volume weight red clover.

Key words: leguminous precrop, cereal, protein content, volume weight, organic management.

REFERENCES

1. Doltra, J., Lægdsmand, M. and Olesen J.E. (2011). Cereal yield and quality as affected by nitrogen availability in organic and conventional arable crop rotations: A combined modeling and experimental approach. *European Journal of Agronomy*, pp. 34-95.
2. Talgre, L. (2013). Biomass production of different green manure crops and their effect on the succeeding crops yield. A thesis for applying for the degree of Doctor of Philosophy in plant production, Tartu, 160 p.