Summary

Thesis title: **Assessing the Impact of Primary Tillage on Soybean**

Author: Ataklti Abraham Zerabruk

Course: MSC Crop Production Engineering

Institute/Department: Agronomy

Primary thesis adviser (name, position, department)

Kende Zoltán (PhD.)

Assistant professor, Institute of Agronomy

Co-advisor: Boglarka Bozoki

PhD. Student, Institute of Agronomy

Different tillage systems have impact on the soybean yield. Therefore this research conducted to evaluate how different tillage tactics act on soybean growth and yield feature, under different primary tillage techniques .which means loosening, ploughing and direct drilling tillage systems Soybean *(Glycine max* (L.) Merr.) Is one from the significant legume crops in terms of its protein composition world-wide? The research was aimed at achieving the effects of different tillage techniques on soybean grain yield and on the physical characteristics of soil state in field conditions, with an emphasis on the agronomic structure, penetration resistance, and moisture content of the soil that affects the yield of soybeans.

. The primary research area was the soybean cultivation method and possible approaches for raising yields in Hungary. Because it has served as both humans' plus livestock' main sources of amino acids as well as oil. Production and yield have not greatly risen over the years, although having enormous implications for the country's economic well-being and availability of food. The research work was conducted at Szárítópuszta, Gödöllő town of Hungary. Experiment was conducted in a Random Strip Design with three tillage treatments were replicated three times. During The experiment the following parameters were measured. They are:- soil penetration resistance between(0 – 15 cm, 15 – 30 cm and 30 – 50 cm) using penetrometer (MPa).Soil moisture content at the depth between (0 – 15 cm, 15 – 30 cm and 30 – 50 cm) using Tensiometer (m/m %).Agronomic structure (clod %, crumb %, small crumb% and dust %) by using different size of sieves(>10 mm,2.5- 10mm,0.25-25mm and < 0.25 mm) also measured and plant parameters such as plant density in m^2,number of pods/plant, number

of seeds/pod and grain yield in kg/ha were recorded. Multivariate Anova was used to analyse the effects of every treatment used on soybean at the level of 0.05 of probability and LSD tests using the SPSS software were used to analyse the significant difference between tillage for each treatment. The research result showed that Loosening had statically highly significant effect at the ($p<0.05$) level on soybean grain yield. Furthermore the study's findings showed that tillage treatments significantly affected soil penetration resistance between 15 -30 cm and 30 -50 cm, plant density, number of pods, number of seeds, and yield. Whereas the different tillage treatments were insignificant ($p>0.05$) effect on soil penetration resistance at depth between 30 - 50 cm, soil moisture content at the following depths between (0 -15 cm, 15- 30 cm, 30 – 50 cm) and dust % fraction which are determining for the soybean yield.