Bulletin USAMV-CN, 63/2007

# YIELD RESPONSE OF WHEAT, MAIZE AND SOY-BEAN IN CHERNOZEM DUE TO DIFFERENT SOIL TILLAGE

**Moraru Paula, P. Guş, T. Rusu, Ileana Bogdan, Ioana Moldovan and A. Pop**

University of Agricultural Sciences and Veterinary Medicine, Faculty of Agriculture
3-5, Mănăştur street, 400372, Cluj-Napoca, Romania, moraru_paulaioana@yahoo.com

**Key words:** minimum tillage, yield.

SUMMARY

The paper presents production results obtained through the researches conducted in the minimum soil tillage field compared with the classic tillage system. The researches have been conducted on a Chernozem Argiloiluvial soil, located in the Frata district. The terrain has a slope of 7%, annual medium precipitation of 550 mm, medium annual temperature of 8.5°C. The soil has in the arable horizon a content of humus determined at the 4.75%, the pH is recorded at 6.8, and the content of clay is situated at 42.45%. The research where conducted between 2005-2007, with the following crop rotation: soy bean – wheat – maize.

The production results revealed that the influence of the soil tillage varies depending by the crop witch is applied on (table 1). On the soy bean culture the production obtained is recorded between 2765-2885 kg/ha, on the experimental variants minimum tilled the production are increased between 99-103 % in comparation with the control, the highest yield being obtained at the cizel soil tillage variant. On the wheat culture, a comparation between the classical variant tilled with the plough with a yield of 3662 hg/ha, and the minimum soil tillage experimental variants yields situated between 3705-3759 kg/ha, represented an increase of 101-103% in comparation with the control, but without statistical assured differences. On the maize culture the application of the minimum soil tillage lead to productions of 95-98% compared with the classical tilled variant. All the obtained results reveal that the soil tillage system in rapport with the crop rotation is very important in order to assure a constant level for the yield.

Table 1

The influence of soil tillage systems upon production of a Chernozem Argiloiluvial in Frata

| Rotation | Soil tillage systems | Plough | Cizel | Paraplow | Rotary harrow |
|---|---|---|---|---|---|
| **Soy bean** | Production, Kg/ha | 2802 | 2885 | 2765 | 2779 |
| | Production, % | 100 | 103 | 99 | 99 |
| | Diff ±/ significance | 0.00 / Control | 83 / * | - 37 / ns | - 23 / ns |
| | DL (p 5%) = 32.35; DL (p 1%) = 95.84; DL (p 0.1 %) = 165.22 | | | | |
| **Wheat** | Production, Kg/ha | 3662 | 3733 | 3759 | 3705 |
| | Production, % | 100 | 102 | 103 | 101 |
| | Diff ±/ significance | 0.00 / Control | 71 / ns | 97 / ns | 43 / ns |
| | DL (p 5%) = 108.01; DL (p 1%) = 144.70; DL (p 0.1 %) = 215.21 | | | | |
| **Maize** | Production, Kg/ha | 7094 | 6815 | 6969 | 6732 |
| | Production, % | 100 | 96 | 98 | 95 |
| | Diff ±/ significance | 0.00 / Control | - 279 / ns | - 125 / ns | -362 / $^{0}$ |
| | DL (p 5%) = 289.13; DL (p 1%) = 337.83; DL (p 0.1 %) = 403.36 | | | | |

Note: ns – not significant, $^{0}$ signification negatives, * significations positive.