AGROTECHNICAL MEASURES TO REDUCE THE INFLUENCE OF DROUGHT ON SUNFLOWER YIELD

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INTRODUCERE

Given the results obtained on sunflower cultivation, the technology of loosening the soil with a chisel can be accepted as a method of conservative work.

Sunflower harvest was also decisively influenced by climatic factors, especially by low rainfall in the first part of the growing season.

The harvest obtained through the technology of conservative loosening of the soil by chisel, in irrigated and non-irrigated soil, was equal to that of the conventional technology.

Conservative tillage, by chisel loosening without turning the furrow and keeping an appropriate amount of plant debris on the surface, can be considered a viable alternative to conventional tillage technology.

MATERIAL AND METHOD

The components of the technological system of plant cultivation that have been studied on the vermic chernozem from SCDA Valu lui Traian refer to the basic work or the main way of loosening and mobilizing the soil. Irrigated (sprinkler) and non-irrigated variants were studied. Sunflower has been grown in a three-year rotation: winter wheat, corn and sunflower.

The experiments were of the Latin square type, with four variants and four repetitions.

Sunflower (Helianthus annuus L.) is a heat-loving crop, but also water-loving, which integrates well into crop rotations in dry areas. Cultivation systems with low tillage can increase sunflower yield in intensive and irrigated cropping systems, using early and medium maturity sunflower hybrids.

The factors investigated were soil tillage and water supply (sprinkler irrigation).

The soil tillage variants tested were:

- conventional tillage (plowing at 28-30 cm) - CV;
- conservative work with chisel at 28-30 cm - Cs;
- reduced work with disc + vibromix.

The water supply options were:

- non-irrigated;
- irrigated with 50% of IUA;
- irrigated with 100% IUA.

Sunflower has been grown in a three-year rotation: winter wheat, corn and sunflower. The experiments were of the Latin square type, with four variants and four repetitions.

Fertilization and other specific works from the vegetation period, for plant protection, for combating diseases, pests and weeds, were applied uniformly for all variants.

THE PURPOSE OF THE RESEARCH

The purpose of the research focused on the following aspects:

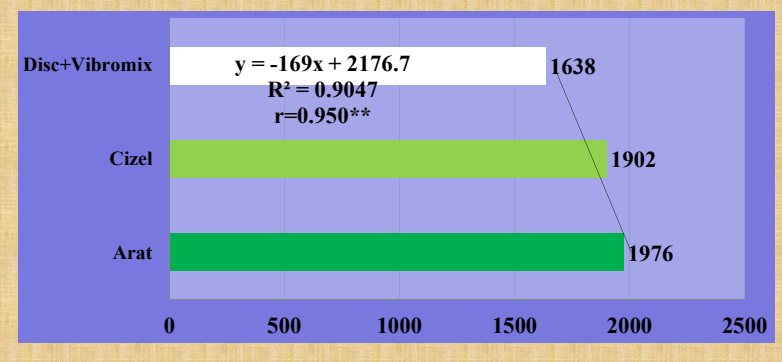
- Introducing soil protection as a technological measure in the exploitation of agricultural land by using secondary production (cereal straw, corn cobs, chopped sunflower stems, etc.) to maintain water in the soil and increase its organic matter content.
- Reducing fuel consumption and labor in mechanical works without diminishing the productive potential of plants.
- Monitoring soil moisture and changes in physical and chemical properties as immediate and residual effects of soil work.
- Development of new technologies for soil use by alternating crops and tillage methods.
- Monitoring land infestation with weeds as an effect of using different tillage methods and combating them.

RESULTS AND DISCUSSION

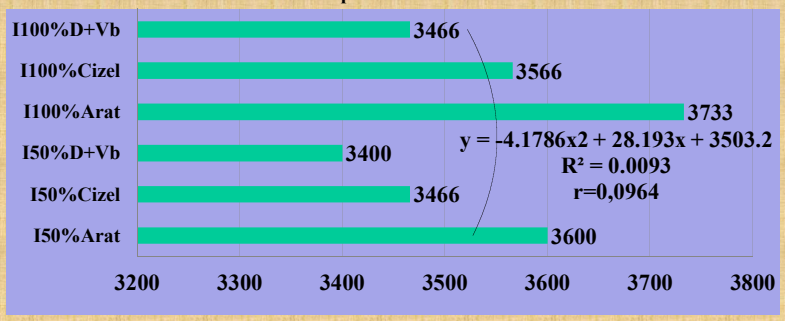
The influence of soil works on sunflower yield In natural conditions of growth and development (without irrigation), only under the influence of soil works, the yield of sunflower increased from 1638 kg / ha (in the disc + vibromix variant) to 1902 kg / ha in the soil tillage variant with chisel and 1976 kg / ha in the plow variant. We find that by loosening the soil with the chisel, without turning, the production obtained is 74 kg / ha lower. Chisel work can be an alternative to loosening the soil by replacing the plowing work.

The productions are statistically assured and are distinctly significant

The influence of soil works on sunflower yield

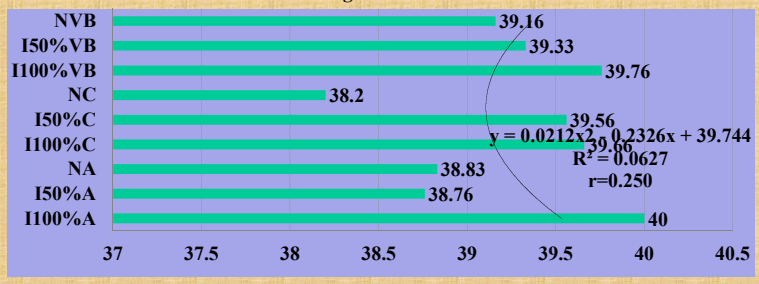


The influence of the interaction of soil works with the level of water supply on sunflower production



The maximum production per experience is 3733 kg / ha and was obtained in the plowed and irrigated version with 100% IUA. On the same level of water supply, in the variant of chisel tillage the production was of 3566 kg / ha, namely 167 kg / ha less than in the plow variant. With 134 kg / ha, the production was lower in the chisel work version and irrigated with 50% of IUA compared to the plow variant (3600 kg / ha). This graph shows that although the productions are the highest, on the two levels of water supply, the production differences obtained in addition do not make this variant of tillage and economic efficiency.

Evolution of the hectolitre mass of sunflower under the influence of soil works and irrigation



The evolution of the mmb and of the hectoliter mass follows the same increasing evolution from the working variant of the soil with disc + vibromix to the plowing work and from non-irrigated to full-irrigated. The values obtained, with small exceptions, are included in the parameters characteristic of the Favorit hybrid, used in the experiment.

The values of the mmb are statistically assured and are very significant.

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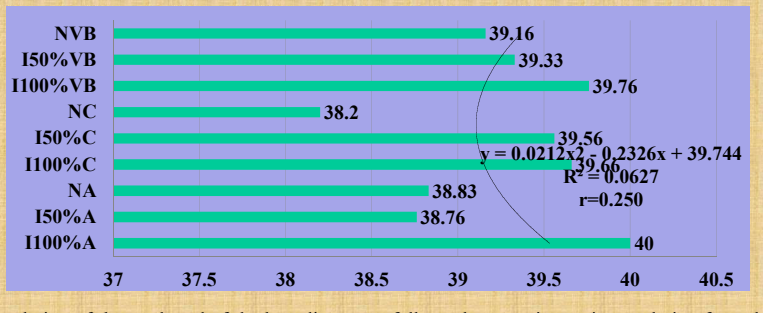

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Short conclusions

- Chisel work can be an alternative to loosening the soil by replacing the plowing work.
- Working with a chisel can be an alternative for loosening the soil by replacing the plowing work, especially in years with normal water supply from rainfall.
- To remove some shortcomings related to weeding and the attack of diseases and pests, once every three to four years the soil can be loosened by plowing.