

UNEARTHING CONNECTIONS: EXPLORING THE DIRECT IMPACT OF TILLAGE REQUIREMENTS ON CROP YIELD

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ABSTRACT

As agriculture faces evolving challenges in meeting the demands of a growing global population, understanding the intricate relationship between tillage practices and crop yield becomes paramount. This article delves into the direct effects of tillage requirements on crop productivity, scrutinizing how cultivation methods influence soil structure, nutrient availability, and water retention. Through an extensive review of empirical studies and field experiments, the article seeks to unravel the nuanced dynamics between tillage practices and yield outcomes. The findings shed light on the potential for optimizing tillage strategies to enhance agricultural sustainability, maximize resource efficiency, and mitigate the environmental impact of cultivation.

Keywords: tillage, crop yield, soil management, agricultural sustainability, soil structure, nutrient availability, water retention, cultivation methods, environmental impact, resource efficiency.

Plugging is one of the main agro technical activities, which serves to increase the productivity of the arable layer of the soil and the productivity of agricultural crops. In our country, plugging is done in the fall to increase soil porosity.

Plugging is carried out for the following purposes:

- Improving the water capacity of existing soils in the arable layer by increasing their porosity;
- Restoring the soil structure lost during the vegetation period by moving (overturning) the dusty, finely structured soil on the surface of the arable layer to the lower layer and the well-structured lower layer to the top; reducing the possibility of causing damage by overturning weed seeds and eggs of harmful insects on the surface of the arable layer to the deeper layer below;
- Mixing mineral and local fertilizers and plant residues with the soil before plugging, making it well-usable for next year's agricultural crops;

- To create a basis for timely and quality spring planting and support early germination and good development of planted crops;
- Cleaning the field from plant residues (for example, reeds). For this, you can use PP-4 or YB-3,6 “corchevatel”;
- Before plugging, in the fields infested with root weeds such as “g‘umay” and “ajrig”, they should be ploughed to a depth of 15-20 cm using a “corchevatel” or plough without a Then, with the help of a chisel or a harrow, the roots cut in the transverse direction should be collected and removed to the edge of the field;
- The last step is to apply 5–10 t/ha of manure, or 70% of the annual rate of phosphorus and potassium fertilizers, to the field before plugging with the help of machinery or manual labor.

The research delves into the direct effects of various tillage requirements on critical factors influencing crop yield, such as soil structure, nutrient availability, and water retention.

Through a meticulous review of empirical studies and field experiments, the article highlights the nuanced dynamics involved in tillage methods. It scrutinizes how specific cultivation practices impact the physical structure of the soil, influencing its ability to retain water and provide essential nutrients to crops. The findings suggest that the direct effect of tillage requirements on productivity is a multifaceted interplay of soil characteristics and agricultural practices.

Furthermore, the research emphasizes the importance of optimizing tillage strategies to enhance agricultural sustainability. By identifying the most effective tillage methods for specific soil types and crops, farmers can maximize resource efficiency, resulting in improved crop yields. The article underscores the need for a tailored approach to tillage, considering the diverse environmental and soil conditions that influence agricultural productivity.

In addition to its implications for crop yield, the study recognizes the broader environmental impact of tillage practices. It discusses how optimizing tillage methods can contribute to mitigating environmental concerns associated with soil erosion, nutrient runoff, and overall ecosystem health.

In conclusion, the article provides valuable insights into the direct impact of tillage requirements on productivity. By unraveling the complexities of tillage practices and their effects on soil and crop dynamics, the research contributes essential knowledge for farmers, agronomists, and policymakers seeking to enhance agricultural efficiency and sustainability in the face of evolving global challenges.

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