

## Influence of Sowing Vicia and Rape Plants on Agro Physical Features of the Soil

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**Annotation:** Sowing the intermediate plants as vicia and rape plants is important in enriching the natural fertility of the soil. This article is focused on the analysis of the influence of intermediate plants(vicia and rape) on capacity mass, porosity and water permeability of the soil and opportunity to germinate profuse and qualitative crop from beasic plants(cotton plant and wheat).

**Key words:** Brown meadow soil, soil fertility, intermediate plants, rape, vicia, remnants and roots, capacity mass, water permeability.

### I. INTRODUCTION

In many countries of the world, scientific research has been conducted and scientifically based on agro-technologies for maintaining soil fertility through intermediate and siderate crops, providing the population with food and green fodder, high and high-quality crops. As a result of planting of intermediate crops, acceleration of biological processes in the soil, improvement of agrophysical and agrochemical properties of the soil has been achieved.

Today, 33.7 million tons of rapeseed from intermediate and siderate crops worldwide. hectares, vika was planted on 550,000 hectares, of which 64.1 mln. tons, 838.8 thousand tons of seeds are grown from vica and are widely used in agriculture. According to the Food and Agriculture Organization of the United Nations (FAO) in 2016, rapeseed production amounted to 18.4 million tons in Canada, 15.3 million tons in China, 6.8 million tons in India and 4.7 million tons in France. , 4.6 million tons in Germany, 297.1 thousand tons in Ethiopia, 148.3 thousand tons in Russia, 119.8 thousand tons in Mexico, 63.1 thousand tons in Spain, 43.2 thousand tons in Belarus. t.

### II. OBJECT AND METHOD OF RESEARCH

The aim of the study is to increase soil fertility by planting rapeseed and vetch intercrops after winter wheat in grassland gray soils and to improve agrotechnology for high and quality yields from subsequent crops.

The object of the study were meadow gray soils, cotton varieties "UzPITI-201" and "Sultan", winter wheat "Andijan-4", rapeseed "Nemerchansky", vika "Mirzachul-1".

The subject of the study is the soil residues and root residues of intermediate crops, agrophysical and agrochemical properties of the soil, the growth of cotton varieties, cotton yield, quality indicators and economic efficiency.

**Research conditions.** The experimental region is located in a biologically active region, the climate is sharply continental, surrounded by mountain ranges around the Tsar. The maximum air temperature in July is up to 42 °C, the lowest temperature in January is -26 °C, and the total useful temperature for the cotton plant is from April 1 to October 20, reaching 2286°C. The average annual rainfall is 247 mm.

Field experiments were conducted in Andijan region, Oltinkul district on the basis of the 2007 manual "Methods of field experiments", the relief of the farm consists of a low plain typical of the central part of the region. Groundwater is located at a depth of 1.5–2.0 m above the ground.

The experiment on the effect of intermediate crops on soil fertility and cotton yield consisted of 4 variants, and experiments were conducted on 4 replicas. The total area of one option was 1440 m<sup>2</sup>, of which the area to be taken into account was 720 m<sup>2</sup>.

**Research methods.** Humus in the soil during the study by the method of I.V. Tyurin; on general NPK- I.M.Maltseva and P.P.Gritsenko; nitrogen in the form of nitrate - by the method of Grandvald-Lyaju; mobile phosphorus - B.P.Machigin; The exchangeable potassium was analyzed in a flame photocolometer by the method of P.V. Pratasov. Phenological observations and soil and plant sampling were carried out on the basis of the methodological manual of UzPITI "Methods of conducting field experiments." The yield of the experiment on returns and variants was based on the method of variance analysis described in the manual "Field experiment technique" by B.A. Dospekhov

### III. DISCUSSION OF RESEARCH RESULTS

Intermediate crops are the amount of root and root remnants left in the soil by vica and rapeseed. One of the ways to enrich the soil with sufficient organic matter is the efficient use of secondary and intermediate crops in agriculture.

The aim of our research is to increase soil fertility by planting intermediate crops after winter wheat in crop rotation systems and plowing them with root and stalk remnants in the fall. As a result, in the areas with high productivity, the main crop is cotton, which has a rich and high-quality yield.

According to F.Namozov [1], in the 1: 2 system of alternating sowing, the amount of organic (root and root) residues in the soil when sowing soybeans after winter wheat, two-component intermediate crops (oats, green peas) after shade, the combined organic content of winter wheat and soybeans 38-40% (4.4 t / ha) compared to the residues, while three-component intermediate crops (oats, green peas, rye) left 45-47% (5.2 t / ha) more organic residues.

According to the data obtained on the residues of root crops and root crops (Fig. 1), a total of 35.6 ts / ha of rapeseed and 31.8 ts / ha of vica were collected, respectively. in the mixed planted variant, 58.6 ts / ha proved once again that planting crops as an intermediate crop as a two-component rather than as a one-component planting is effective in accumulating a large amount of organic mass in the soil.

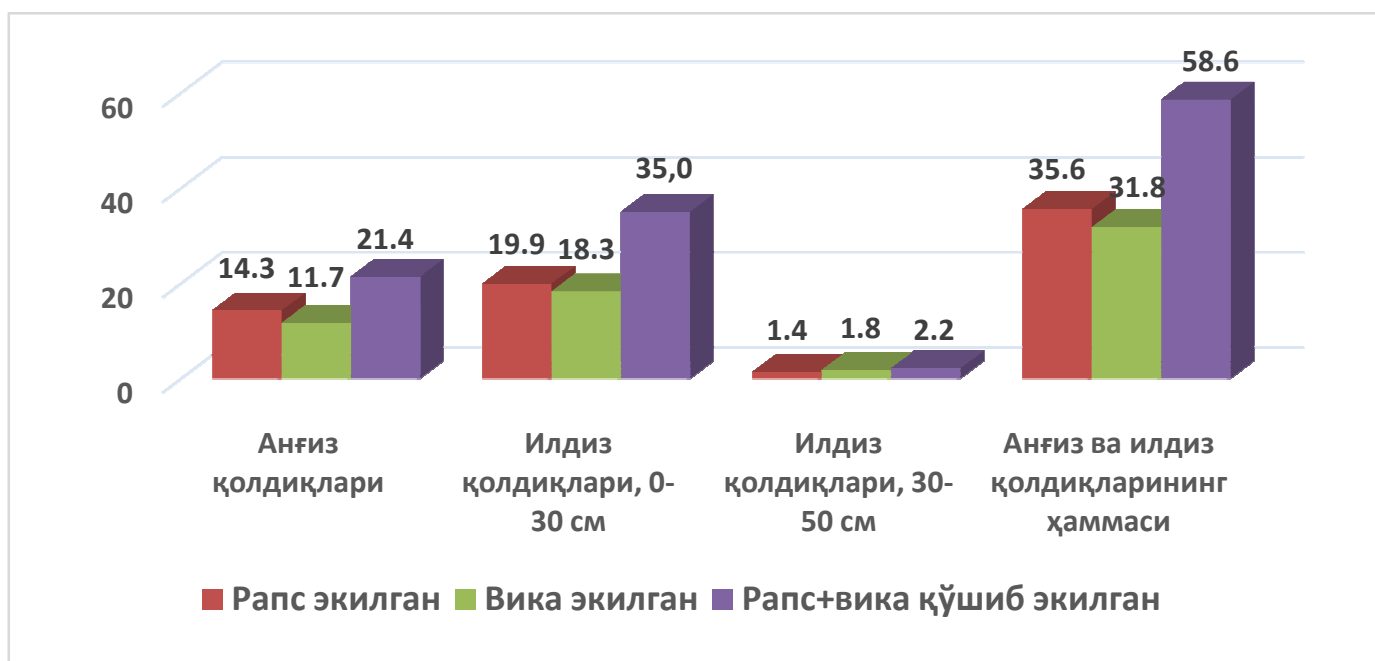


Figure 1. Sprouts and root residues of winter wheat and intermediate crops, ts / ha.

The stalks and root remnants left by the winter wheat were 35.4 in proportion to the options; 35.2; 39.9; 37.2 ts / ha, which corresponds to the total nitrogen variants - 1,334; 1,418; 1,230; After winter wheat, the residues of root and root in the intermediate rapeseed variant were 35.6 ts / ha, in the intermediate vica variant 31.8 ts / ha, and in the rapeseed and vica variant 58.6 ts / ha. forming 1,357 in proportion to the nitrogen variants they contain; 1,184; Was 1.602%.

Change in the bulk mass of the soil. The volumetric mass of the soil is important in determining its fertility, in the normal growth and development of plants, in increasing their productivity. It is known from the literature that for the good development of the root system of the plant, the water-physical properties of the soil, ie the volume mass, water permeability must be within specified limits. Many scientific sources indicate that the optimal bulk mass of soil is 1.2-1.3 g / sm<sup>3</sup>.

KM Mirzajonov and H. Yusufjanov [2] in their experiment in Kuva district, Fergana region, sowed rye separately in autumn and as a siderate crop between rows of cotton mixed with rye and rapeseed seeds. According to the results of the experiments, the volume mass of the soil decreased from 1.23-1.37 g / sm<sup>3</sup> to 1.13-1.25 g / cm<sup>3</sup> between the rows of cotton planted with rye itself and rye mixed with rapeseed. structure and water permeability have also been improved.

The volumetric mass of the soil is directly related to the development of the root system of crops as well as the surface stem. The level of development of plant roots also affects the volume mass of the soil.

In our study, the effect of intermediate crops on soil volume mass before sowing was studied, and the data obtained are presented in Table 1.

The volume mass of the soil in the 0–30 cm layer of the control variant left without intercropping averaged 1,352 g / sm<sup>3</sup>, while the intermediate crop averaged 1,346 g / sm<sup>3</sup> after rapeseed and rapeseed, and 1,312 g / sm<sup>3</sup> when planted with rapeseed and rapeseed. It was observed that the change in soil volume mass decreased by 0.04 - 0.03 g / sm<sup>3</sup> compared to the remaining variants when planting with the addition of vetch and rapeseed, and accordingly the soil porosity also changed positively. In the experimental field, the addition of vica and rapeseed caused a positive change in the volumetric mass of the soil, with residues of stalks and roots left in the soil.

In our research, it was found that the optimal amount of mass was formed when the intermediate crop was planted with rapeseed and vetch, optimal conditions were created for the growth of cultivated cotton, soil aeration was moderate, air quality was improved, soil microbiological and nitrification processes were activated.

Effect of vica and rapeseed planted after winter wheat on soil water permeability. The property of the soil to absorb water and transfer it to the lower layers is called water permeability.

Water permeability, which is one of the agrophysical properties of soil, is of great importance in the growth and development of plants. Therefore, in research related to increasing soil fertility, special attention is paid to the water permeability of the soil.

In the research of F.Namozov [1], after winter wheat, soybeans, oats, green peas, and rye mixtures were planted. was 120-135 m<sup>3</sup> / ha, respectively, compared to the indicator (autumn 2005).

During the experiment, the effect of intermediate crops on soil water permeability was also determined. Prior to planting the intermediate crops, the initial water permeability of the experimental field soil was found to be 701 m<sup>3</sup> / ha for 6 hours (Table 1).

**Table 1 Influence of experimental field soils on water permeability, (m<sup>3</sup> / ha)**

Fixed time, hours	Before planting intermediate crops	Before sowing the seeds, at the beginning of the period of application of cotton			
		Control not planted after fall wheat	In the area planted with intermediate rapeseed	In the area where the intermediate Vica is planted	Intermediate crop Raps + vica in the planted area
1	218	231	246	264	268
2	144	156	174	172	195
3	121	133	122	136	124
4	78	86	86	84	96
5	72	72	78	72	72
6	68	64	59	68	64
<b>In total 6 hours</b>	<b>701</b>	<b>742</b>	<b>765</b>	<b>796</b>	<b>819</b>

It was observed that the water permeability of the soil was higher in the variant planted by adding rapeseed with rapeseed when the average experimental field water permeability was determined for 6 hours before sowing the seeds after intermediate crops. That is, for a total of 6 hours, the control variant was 742 m<sup>3</sup> / ha, while the variants were 765, 796, 819 m<sup>3</sup> / ha, respectively, and the water permeability was 77 m<sup>3</sup> / ha in the variant planted with rapeseed and vetch (1- table) [3].

## CONCLUSION

It can be concluded from the results of the study that in the 1: 1 system of alternating sowing, when mixed crops of intermediate crops (rapeseed + vika) were planted in the vacated areas of winter wheat, 58.6 ts / ha of manure and root residues remained in the soil, resulting in 0.04 - 0, Was reduced to 03 g / cm<sup>3</sup> and the water permeability was found to be high.

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