Study on the influence of sideration on soil density and porosity

Yunus\textsuperscript{1,2}*, Zamira\textsuperscript{3}*, Salomat\textsuperscript{3}*

Abstract. The paper presents the results of research on the influence of sideration on soil density and porosity. The study was conducted in the conditions of the Republic of Uzbekistan, in the region of Tashkent. The experimental material was represented by the varieties of alfalfa (Medicago sativa L.), lamp (Lolium perenne L.) and barley (Hordeum vulgare L.). The research was conducted on sandy-loam soil. Different variants of treatments were considered: with and without green manure, with and without green manure application. The data obtained showed that the use of green manure reduces soil density by 7-13\%. The mass of soil before the first irrigation of cotton in 0.08 m³ in alfalfa and 0.07 m³ in lamp. It was determined that the rotting process of organic compounds is extremely important in the occurrence of productivity and in the process of soil fertility recovery. The experiments were conducted by Ernazarov\textsuperscript{4}, Abdushukurova\textsuperscript{5}, Abduhaiderov\textsuperscript{6} and Abduhaiderov\textsuperscript{7}.

1. Introduction

The organization of farmers’ specific peculiarities of farm management especially those related to the introduction of manure crops and stirred of green mass also positively impact the physical properties of the soil, the soil fertility changes and the yield of the next crops increases. The scientists have developed a variety of activities and methods, including land treatment, fertilizers and various pesticides and others. To prevent these negative states, it is very important to develop natural technology systems of agro physical, agrochemical and biological properties of the soil, the soil fertility changes and the yield of the next crops increases.

According to Kh. Ye. Abdushukurova\textsuperscript{8}, in the cotton freed areas, and autumn October 10 tons of stalk, root and leaf residues are stirred per hectare. The experiments were conducted by Ernazarov\textsuperscript{4}, Abdushukurova\textsuperscript{5}, Abduhaiderov\textsuperscript{6} and Abduhaiderov\textsuperscript{7}, the mass of the soil determines its hydrometric, air and microbiological states. Green manure crops and stirred of green mass also positively impact the soil porosity.
To keep the ecological balance of the former cotton fields and to restore soil fertility, leguminous crops play a great role to develop farm production in Central Asian conditions. The leguminous crops collect 300 kg of biological nitrogen and other nutritious elements per ha and improve the soil fertility and allows growing consistently abundant, quality and inexpensive products. It helps not only to increase soil fertility but enables to grow abundant, quality and inexpensive products as well as harmful salt comparatively to tap root plants. Because the root residues of these varieties spread widely into the deep soil and serve as a natural drainage, more than 10 tons of organic matter will be collected per hectare in tilling part of the soil, and this improves the soil fertility.

In irrigated condition during the development of measures, the contribution of natural factors that improves soil fertility was expected in tilling layer of the cotton fields. The methods by Uzbekistan plant growing institute (1986); Uzbekistan cotton growing scientific research institute centers' experiments confirm, it is purposeful to introduce cereals and forage crops, leguminous crops and intercrops into rotation system. In the republican crop rotation recommendations, it is being expected in tilling layer of the cotton fields.

The world scientists as well as our republican leader research institute centers’ experiments confirm, it is purposeful to universally introduce leguminous crops and intercrops as green manure in rotation system. The studies by Kachinski method and foreign scientists state that intensively decreasing of humus quantity in the composition of the crops based on rotation system is expected during coming years. The services of the scientists on increasing soil fertility were highly appreciated by Commonwealth countries, in particular, by European and Asian countries agriculture research centers. The introduction of leguminous crops and intercrops into rotation system play an important role in maintaining the agrophysical properties of the soil, including in Uzbekistan, it is said that the organic matter positively influences on soil fertility, harvest and quality as well as harmful salt. Extensive scientific research on the effectiveness of intercrops have been done in Uzbekistan. It is obviously that the soil fertility is not to be able to restore by applied measures and this problem can be solved correspondingly. The services of the scientists on increasing soil fertility were highly appreciated by Commonwealth countries, in particular, by European and Asian countries agriculture research centers. The introduction of leguminous crops and intercrops into rotation system play an important role in maintaining the agrophysical properties of the soil, including in Uzbekistan, it is said that the organic matter positively influences on soil fertility, harvest and quality as well as harmful salt.
3. Results and Discussion

In this case, the soil porosity was accounted and average 3 years analyzed.

As manure sown before latter of irrigation in tilling layer relatively, soil was recorded for rape and barley green manure variants without green manure and in variants with green manure decreasing of mass of soil was found. Thus, the mass of soil increased in tilling layer before the first and last irrigation of cotton.

Minimum increasing of mass of soil in tilling layer was recorded (1\text{g/cm}^3) green manure before the mature irrigation of cotton and barley. Much increasing of soil mass in tilling layer was observed in rape sown green manure variant relatively to control variant without green manure, before and latter irrigation of cotton. The microbiological and air properties will be favorable in these positions of soil. As most researches show that each green manure type and change mass of soil is suitable green manure for Bondarev, Dimo and others point of view.

For Muhammadjanov, the density was equaled to 1\text{g/cm}^3 for per plant and 0.98 \text{g/cm}^3 in 20 cm of layer compare with control variant without green manure and in variants with green manure decreasing of mass of soil was found. Minimum increasing of mass of soil in tilling layer was recorded (1\text{g/cm}^3) green manure before the mature irrigation of cotton and barley. Much increasing of soil mass in tilling layer was observed in rape sown green manure variant relatively to control variant without green manure, before and latter irrigation of cotton. The microbiological and air properties will be favorable in these positions of soil. As most researches show that each green manure type and change mass of soil is suitable green manure.
High porosity was in pea and chick pea versions relatively to. Consequently, Maximum porosity was in rape and chick pea variants relatively.

The compost is a key of yield in 2008 and or in 2010 the soil grainy as well as green manure provides with high qualitative yield in 2016.

Table 1. The influence of past crops on soil fertility, as well crop yield

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<th>Experiment variants</th>
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4. Conclusions

The concept and future prospects of soil health Eco-environmental benefits of planting green manure in paddy fields. What is green manure?

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