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DYNAMICS MOISTURE RESERVES AND THEIR AVAILABILITY PLANTS
IN TYPICAL BLACK SOIL BY VARIOUS TILLAGE SYSTEMS.

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In the article presents the results of studies of the dynamics of productive moisture in typical black soil and their availability to plants in the main phases of development of corn. Deep non plow tillage form the largest average moisture reserves of the soil layers 0-100 and 0-200 cm, provides good water permeability of the upper layers to form a reserve of moisture in autumn and winter, high availability of water, continuous flow through the capillaries to the roots plants and their rational use in the growing corn.

Productive moisture, deep non plow tillage form the largest average, water permeability, availability of water.

Soil moisture reserves and it may be subject to water reclamation and farming practices. Troy L. Thomson and F. [in book 4] the most common ways of regulating moisture reserves in the soil carried: 1) Irrigation in poor wetting; 2) drainage of excess moisture conditions in the soil profile; 3) mulching to reduce evaporation of soil surface; 4) carrying out measures to improve the accumulation of moisture in the soil. The first two ways of regulating soil moisture reserves are expensive and require significant capital investments. Latest considerably cheaper and depend on cultivation methods.

Many studies have found that low soil wetting process traditional plowing impractical due to high moisture loss by evaporation from the surface [2, 3, 6, 8, 9,

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10]. Left stubble when using bezpolytsevoho cultivation contributes snow retention and, thus, increases soil moisture reserves [3, 4].

Many studies have bezpolytsevyh advantage over traditional plowing cultivation and especially in dry conditions [2, 3, 8, 9]. This is how large amounts of moisture that accumulates in autumn winter and decrease evaporation during the growing season. Research has established that most effectively used for wet ecological farming systems and polytsevo-bezpolytsevoho primary tillage in crop rotation [5]. That is, there are different views on the impact on stocks of soil moisture and its availability for crops.

The purpose of research - to determine the impact of different tillage systems on the dynamics of water reserves in the layers 0-50, 0-100 and 0-200 cm and their availability in different phases of corn.

Terms of researches. The study was conducted in NUBiP of Ukraine "Nizhyn Agrotechnical Institute» Chernihiv region during 2009-2010. Soil research area - a typical black soil on loess serednosuhlynkovyy humus, humus content in the topsoil $-3,87 \pm 0,13$, in the subsoil $- 3.69 \pm 0,14$. In experiment studied four possible primary cultivation: traditional - plowed to a depth of 23-25 cm of soil under cultivation riznohlybynny bezpolytsevy different cultures to 23-25 cm of soil ploskorizny shallow soil at 10-12 cm of soil cultivation riznohlybynny bezpolytsevy with periodic loosening under different cultures at 23-25 cm. Soil samples were taken every 10 cm to 50, 100 and 200 cm in the main phase of growth and development of corn. In soil samples were determined: density by taking the cylinder by Kaczynski and moisture content. [7].

Results and analysis During the growing season is necessary to create the optimum conditions of soil moisture, as both lack and excess moisture adversely affect plant growth and development. Thus, optimization of water and soil fertility physical conditions closely associated with cultivation. Shows the average of

productive moisture reserves data for 2009 and 2010 in soil layers 0-50, 0-100 and 0-200 cm by different variants of soil tillage. In the upper 0-50 cm layer during this period revealed slight differences inventories moisture variations and experiment was a noticeable trend (2-4 mm) for better wetting soil deep loosening of soil bezpolytsevoho. This trend became more pronounced in the layer 0-100 cm, where the same advantage over the soil and shallow plowing ploskoriznym cultivation was significantly and amounted to 8.6 mm.

The biggest difference between these variants detected in 0-200 cm soil layer, where it grew to 10-14 mm. By increasing the depth of soil were increased moisture reserves in the soil where major indexes were a variant of deep soil loosening bezpolytsevoho. It should also be noted that 2009 was a dry and all layers of the studied soil moisture reserves were kept lower than in 2010. However, in all versions of cultivation in 0-100 cm layer classification Vadyuninoyi AF, Korchagin SA are characterized by an average growing season as good [1].

For assessing plants moist enough not to have average data of its stock during the growing season, but should have average data for the phases of its stocks of corn for grain, ie the dynamics of stocks during the growing season.

Culture is particularly demanding on the soil moisture content in the first half of the growing season to the ejection of panicles. Most of the reserves of moisture formed in the autumn-winter period and then they gradually consumed during the growing season despite the fact that it is in the spring and summer for a large part of the rainfall.

Moreover meter layer of 0-50 cm and especially more characterized by a decrease in moisture dvohmetrovyi. This bezpolytsevi cultivation provide higher amounts of moisture in the upper and the whole meter layer of soil by plowing. The largest were for deep cultivation bezpolytsevoho with periodic loosening, which

provided high permeability of the upper layers to form reserves of moisture in autumn and winter rational use during the growing season corn.

In the second half of the growing season corn stocks moisture meter layer aligned with the exception of periodic loosening version, which had the advantage especially in deeper layers. In general, stocks of productive moisture in a meter layer were satisfactory. It should also be noted that the option of shallow cultivation bezpolytsevyi other inferior soil moisture reserves in the soil layer dvohmetrovoomu, while in the upper 0-50 cm layer significant difference between variations were found.

Conclusions. The highest average stocks of productive moisture in soil layers 0-100 and 0-200 cm watched with deep soil loosening bezpolytsevoho who were 118-132 and 258-280 mm more than the shallow plowing and cultivation bezpolytsevyi 6-8 and 10- 14 mm. The same system of cultivation ensures high permeability of the upper layers to form reserves of moisture in autumn and winter and water availability, uninterrupted flow of the capillaries in the roots of plants and their rational use in the growing season corn.

List of references

1. Вадюнина А. Ф. Методы исследования физических свойств и грунтов / А. Ф. Вадюнина, З. А. Корчагин. – М.: Высш. шк., 1973. – 395 с.

2. Єщенко В. О. Агрофізичні показники родючості чорнозему опідзоленого за різних способів і глибин основного обробітку ґрунту / В. О. Єщенко, Л. М. Кононенко // Агрохімія і ґрунтознавство. Спец. випуск до VII з'їзду УТГА. – Кн. 2. – Харків, 2006. – С. 61–64.

3. Медведєв В. В. Новітні ґрунтоохоронні технології і технічні засоби в землеробстві / В. В. Медведєв // Агрохімія і ґрунтознавство. Спец. випуск до VIII з'їзду УТГА. – Кн. 1. – Харків: КП Друкарня №13, 2010. – С. 87–97.

4. Охорона ґрунтів / [Шикула М. К., Гнатенко О. Ф., Петренко Л. Р., Капштик М. В.]. – 2-ге вид., випр. – К.: Знання, 2004. – 398 с.
5. Танчик С. П. Вплив систем землеробства на вміст доступної вологи в ґрунті в полі буряків цукрових Правобережного Лісостепу України/ С. П. Танчик, С. М. Сальніков // Науковий вісник НУБіП України. – № 183. – Ч. 2.–2013. – С. 123–128.
6. Blevins R. L. Influence of no tillage on soil moisture/ R.L.Blevins, D.Cook, S.H.Phillips // Phillips Agronomy Journal. – № 63. – 1971. – P.593–596.
7. CEN ISO/TS 17892-1:2004 Геотехнічні дослідження та випробування. Лабораторні дослідження ґрунту. Ч. 1. Визначення вмісту води.
8. Gbadamosi J. Impact of different tillage practices on soil moisture content, soil bulk density and soil penetration resistance in oyo metropolis, Oyo state, Nigeria. / J. Gbadamosi // Transnational Journal of Science and Technology September 2013 edition Vol.3, №9. – P. 50–55.
9. Kanwar R. S. Effect of tillage systems on the variability of soil water tensions and soil water contenttransactions of ASAE / R.S. Kanwar // № 32. – 2003. – P. 605–610.
10. Soil compressibility and penetrability of an Oxisol from southern Brazil, as affected by long-term tillage systems/ M.Veiga, R.Horn, D.J. Reinert, [et. all]// Soil and Tillage esearch. – 2007. – № 92.– P.104–113.