Sciences of Europe

VOL 1, No 70 (2021)

Sciences of Europe
(Praha, Czech Republic)

ISSN 3162-2364
The journal is registered and published in Czech Republic.
Articles in all spheres of sciences are published in the journal.

Journal is published in Czech, English, Polish, Russian, Chinese, German and French, Ukrainian.
Articles are accepted each month.
Frequency: 24 issues per year.
Format - A4
All articles are reviewed
Free access to the electronic version of journal

All manuscripts are peer reviewed by experts in the respective field. Authors of the manuscripts bear responsibility for their content, credibility and reliability.
Editorial board doesn't expect the manuscripts' authors to always agree with its opinion.

«Sciences of Europe» -
Editorial office: Křižíkova 384/101 Karlín, 186 00 Praha

E-mail: info@european-science.org
Web: www.european-science.org

CONTENT

AGRICULTURAL SCIENCES

ARCHITECTURE

HISTORICAL SCIENCES

PHYSICS AND MATHEMATICS

TECHNICAL SCIENCES

3. В ходе исследований ни разу не было отмечено превосходство дочерей над родительскими формами по обильномолочности, зачастую пробанды сильно уступали в показателях. Отмечены некоторые закономерности в наследовании жирномолочности и белковомолочности в стаде СПА (К) «Кузьминский».

Литература

1. Бирюкова, С.А. Молочная продуктивность матерей и их дочерей в стаде голштинского скота ООО «Слактис» Псковской области / С.А. Бирюкова, А.В. Харитонов, Ю.В. Аржанкова // Известия Великолукской государственной сельскохозяйственной академии. – 2021. – № 1. – с. 3 – 9

2. Лефлер, Т.Ф. Влияние матерей на формирование продуктивности потомков / Т.Ф. Лефлер, А.А. Нагибина, И.В. Сидоренкова, И.Я. Строгонова // Вестник КрасГАУ. – 2020. – № 5. – с. 106 – 110

3. Чеченихина, О.С. Показатели молочной продуктивности коров – дочерей в зависимости от наивысшего удоя их матерей / О.С. Чеченихина // Животноводство и кормопроизводство. – 2020. – № 3. – с. 165 – 176

4. Шендаков, А.И. Генетическая детерминация признаков молочной продуктивности у голштинских коров немецкого происхождения / А.И. Шендаков // Вестник аграрной науки. – 2020. – № 3 (84). – с. 69 – 75

CHARACTERISTICS OF LAND RESOURCES AND SOIL COVER IN THE VINNITSA REGION

Pelech L.
Vinnytsia National Agrarian University
Vinnytsia
DOI: 10.24412/3162-2364-2021-70-1-7-12

ABSTRACT

Soil has traditionally been the primary means of agricultural production. It is a valuable asset of our country. Ukraine has 5.7% of Europe's land area - 60,354.8 thousand hectares. Ukraine accounts for 5.7% of the territory of Europe and amounts to 60354.8 thousand hectares. By the area of agricultural land and arable land Ukraine ranks first in Europe. Europe. At the same time, with such a large land fund According to various scientific assessments, Ukraine is capable of providing food for 250-320 million people, while at the same time it is the richest in the world in black soil. According to scientists, Ukraine is unable to feed 250-320 million people, although it cannot guarantee its own food security [1]. guarantee its own food security [1,2].

Vinnitsa region from the position of assessing its land and resource potential Vinnytsia is a powerful and promising region from the point of view of its land and resource potential. Resources in its total natural-resources potential (79,11%). Vinnitsa region takes the first place among other regions at an average level of this indicator in Ukraine - 44,11%. Ukraine - 44,38%. Thus, today the main objective is the rational use of land and resources in the region. The main task today is the rational use of the land and resource potential in the agricultural production. The rational use of land and resource potential in the agricultural manufacture which requires an appropriate scientific ensuring. It is a comprehensive analysis of the soil cover of Vinnitsa region from the point of view of position of assessment of factors of soil formation, regime characteristics in the context of the main types of soils and, on the basis of that, the analysis of key directions increase of general efficiency of the use of soil of the region is the purpose of work [2].

Keywords: soil, humus, fertility, soil cover, nutrients substances.

The territory of the region is 26.5 thousand km^2, 4.4% of the territory of Ukraine. The region is located in the forest-steppe belt of the right-bank part of Ukraine. Vinnitsya region has 202 km of state border with the Republic of Moldova, it also borders with 7 regions of Ukraine: Zhitomir, Chernovtsy, Khmelnitsky, Kiev, Cherkassy, Kirovograd and Odessa regions. Vinnitsya region is situated in the forest-steppe zone of the central part of the Right-bank Ukraine. The territory of the land is 2606.4 thou.ha, or 98.4% of the total area of the region, the rest (1.6%) is occupied by internal waters. The rivers flowing into the basins of the Southern Bug, Dniester and Dnieper, include 2 large (the Southern Bug and Dniester), 4 medium-size (the Sob, Gornyi (Gniloy) Tikich, Murafa and Ros' rivers) and 4,555 small rivers [3]. Referring to A.A. Sheveliuk [4] and others [3], the present structure of land fund of Vinnitsa region has been formed during a long period under the influence of different factors. Plain surface, favorable natural and climatic conditions, ancient economic development of the investigated territory caused radical transformation of the environment. The total area of lands within the limits of Vinnitsa region is 2649,2 thousand ha and their distribution on the main categories is uneven. From all categories the lands of agricultural destination prevail, they account for 76.1% up to the public. The lands of the forest fund occupy the second place by area in the region, after the lands of agricultural purpose. According to the data of the Main Department of Land Resources in Vinnytsia region the area of forests and other forest-covered territories makes up 378,7 thousand ha (14,3%), 239,6 thousand ha of which are covered with forest vegetation. Forest cover of the region is lower than in other Oblasts, it is caused by economic development of the analysed area. Water areas in the region occupy an area of 43,5 thousand hectares (1,6% of the total area of the region) and are represented by lands under both natural and artificial water bodies. The main type of land use in the region is agricultural. The share of agricultural lands in

all categories of land users, together with homestead lands, is 75.9% of the total area of the region. Cropland accounts for 85.7%, pastures - 9.3%, hayfields - 2.5%, land with perennial plantings - 2.5%. The average land area per capita in the Oblast is 0.98 hectares of arable land. Almost half of the Oblast's agricultural land (49.0%) is characterised by a rather high level of natural fertility and is represented by a complex of chernozem and meadow-chernozem soils. More than 17% of the area is occupied by grey podzol soils of medium fertility. However, on one third of the whole area (31,4%) relatively low fertility light grey and grey podzol soils prevail. In addition, on 98,0 thousand ha (5,3%) there are low fertility soils: sod-podzolic, loamy, alkali-marshy and boggy soils. The area of valuable soils in Vinnitsa region is 835 thousand ha. The structure of the soil cover is the following: grey forests - 50,5% and chernozems - 42,1%. Granulometric composition varies from light loamy (content of physical clay, fractions with a diameter less than 0,01 mm is 20 - 30%) in the north of the region to medium loamy (30-45%) in the centre and important loamy (45-60%) in the south with a weighted average density in the range 1,28-1,32 g/cm3. Grey forest soils are divided into three subtypes depending on humus content, depth of humus horizon, development of podzolized horizon, intensity of colouring: light grey, grey, dark grey. The content of humus in these soils varies from 1.85% to 2.4%. Black earth soils are located in the north-east, south-east and south of Vinnitsa region. Among chernozems Vinnitsa identified the following subtypes: podzolised, regraded and typical. Fertility ranges from 3.39% in podzolised to 3.8% in regraded chernozems. The most fertile soils in Vinnitsa are grey and dark grey podzoled mocharic, black podzoled mocharic and mocharny soils. They contain 3.5-5.5% of humus and occupy 1.7% of the oblast's territory.

The total share of public land is 6.5%, commercial land accounts for 1.6% and mixed use land accounts for 1.7% of the total area of the region. In total on the territory of the area there are 3600 rivers and streams with a total length of 11800 km, the density of a river network is 0,43 km/km2. Within the Vinnytsa region there are two large rivers (Southern Bug and Dniester), four middle-size rivers (Sob, Murafa, Ros, Gorny Tikich) and 226 small rivers with the length over 10 km. A significant amount of the region's water resources is accumulated in the created reservoirs and lakes. In the oblast there are 65 water reservoirs with the total water surface area of 11 167 hectares and water volume of 282 600 000 m3; there are 4033 ponds with the total water surface area of 20 552 hectares. Water fund lands account for 1.6% of the Oblast's territory, with the largest proportion being bets (53.1%). Man-made reservoirs (22,8%), natural waterways (20,8%) and artificial waterways (3,1%) have a much smaller share. The share of lakes, coastal and enclosed bodies of water, and estuaries is only (0.01%). More land, water resources are concentrated in Bershadskyi - 2780,9 ha, Litinskyi - 2627,9 ha, Kalinivskyi - 2465,6 ha, and less in Peschanskyi - 180,9 ha, Tomashpolskyi - 282,9 ha, Kryzhopolskyi - 390,4 ha and Chernivtsi - 400,4 ha. As of 01.01.2010, the area of the objects and territories of nature reserve fund. Vinnitsya region amounted to 27,3 thousand ha, which was only 1,03% of the total area.

The soil cover of Vinnitsa region is relatively homogeneous. The most widespread types of soils are gray forests - 1000,1 thou.ha, or 50,5%, and chernozems - 830,8 thou.ha or 42,1%. Sod-podzol soils are widespread in northern part of the region. Their area is too small, not exceeding 13,2 th.ha, which is 0,6% of the total area of the region. These soils have been formed on sandy sediments under forest vegetation, on old alluvial deposits, under podzol and sod processes. They were formed under mixed and pine forests in conditions of stagnant-washing water regime on water-glacial, moraine, loess-like sediments. Water-glacial deposits are often underlain by crystalline, chalky-marl rocks, moraine loams or kaolins. The main diagnostic features of these soils are the clear division of the profile into humus-eluvial (HE), eluvial (E) and iluvial (I) horizons, weak humus content (from 0.8-1% of humus in sandy and clay-sandy soils to 1.5-2% in loamy ones). Humus is coarse, especially in soils under forests, with large amounts of low-mineralised and charred organic residues. In the composition of humic substances fulvic acid carbon prevails over humic acid carbon. The SCC / SFC ratio is 0.3-0.5 in sandy and clay-sandy soils and 0.5-0.8 in light loam soils. The soil absorbing complex is poorly saturated with bases. The most common are in Kalinouski district - 1281 ha; Vinnitskii district - 678 ha; Gaisinskii district - 741 ha; Lipovetskii district - 1122 ha. Sod-podzolic soils are the least fertile. Reaction of the soil solution in these soils is acidic (pH 4,6-5,5), hydrolytic acidity is within 2,0 mg equivalent per 100 grams of soil.Sum of absorbed bases is on the average 2,5-4,0 mg equivalent per 100 grams of soil, so the saturation of bases is only 55-70%. Sod-podzolic soils are poor in organic matter, with a negative water-air and nutrient regime. They are used only for unpretentious crops (potatoes, oats, lupine, rye), with the use of special lupine (sideral) crop rotations. As in these soils, because of their specific agrophysical and physicochemical properties, nutrients are washed away very quickly, so it is necessary to apply fertilizers often and in small doses. Nitrogen fertilisers are particularly effective, but it is better to apply full mineral fertilisers in combination with organic fertilisers. The low absorption capacity of the soil requires lime treatment in small doses. Also, sod-podzolic soils need to be protected against wind erosion, with shrubs and shelterbelt forests. The profile structure and agro-productive properties of sod-podzolic soils largely depend on soil and bedrock. Therefore, depending on the nature and depth of bedrock, soils are divided into non-glibopidstyle soils (bedrock deposits from 0.5 to 1 m) and glybocopidstyle soils (bedrock deposits at a depth of 1-2 m). According to the degree of definition of podzolic process - into weak, medium and strong podzolic soils. Significant area of sod-podzol soils is ploughed up and changed to different extent under the influence of intensive agricultural activity of man. However, at present there are no sufficiently clear diagnostic indicators allowing to separate these soils according to the degree of change in their properties as a result of cultivation.

Therefore, among degraded sod-podzol soils only clearly cultivated ones are distinguished. These include soils of highly cultivated backgrounds. They are distinguished by obvious signs of cultivation: more powerful (25-30 cm) and uniformly coloured humus horizon, some accumulation of organic and clay substances in the eluvial horizon, increase of root layer (the roots penetrate the eluvial horizon). Sod-podzol soils are rare, occurring on tops and gentle slopes of moraine hills. Profile structure: humus-alluvial horizon (HE) 20-25 cm thick, grey, cloddy-dusty; the transition is sharp. Eluvial horizon (E), expressed by individual light patches or layers 5 cm thick, consisting of washed clayey sand, sometimes with occasional ochre spots of seasonal over-wetting. The illuvium horizon (I) is red-brown, dense, clay-rich, lumpy-prismatic, downwardly lumpy and less dense; it often contains lenses or layers of coarse sand with stones and pebbles.

Light grey forest podzoled soils. These soils occupy only 4,1% of the whole area - 81,9 thousand hectares (are not widely spread within the oblast). They have been formed in places with minimum values of the hydrothermal coefficient Selyaninov (ratio of precipitation sum to temperature sum in a warm season multiplied by 10, further in the text GTC V-IX) about 1,25, caused by both climatic factors and relief due to additional inflow of moisture at redistribution of precipitation, in GTC V-IX = 1,80. The formation sites of such soils are favourable for forest vegetation - it was dominant and herbaceous cover was negligible (<40% of the projective cover). Therefore, they are characterized by a clear differentiation of the profile by eluvial-illuvial type and peculiar humusogromadzhennya in it. Horizons are distinguished: HE - humus-illuvial (9-18 cm in virgin soils, 25-30 cm in developed soils), E - eluvial (correspondingly 25-35 and 10-20 cm), and - iluvial in upper part always markedly humus and P - mother rock from 100-130 cm. Light grey forest soils are divided into surface-wet and automorphous soils. Clay species are confined to the moderately humid part of the forest-steppe with GTC V-IX = 1,50-1,60, in them faint signs of gleying are observed from the lower part of the eluvial horizon in the form of rust brown and brown slightly olive spots. Ogleying intensifies down the profile, as indicated by ochre-brown spots, black dots and olive-blue inclusions. The latter signs are also characteristic of the parent carbonate rock. Intense signs of gleying are usually characteristic of soils in which more than 35% of the physical clay. On the territory of Vinnytsia strongly podzoled light grey and grey forest soils have formed under oak-horn forests on the most elevated and articulated massifs of the central part of the region (Zhmerynskaya upland and south Kazatynska), namely on the most elevated massifs Buzhsko-Dnistrovskyi watershed. The analysis of the mechanical composition of light grey podzolized soils indicate a strong wash out of fine fractions from the upper podzolized horizons. Humus-eluvial horizons have light loamy, sometimes middle loamy mechanical composition, and silt is important loamy or clayey (Table 2.8, see A, B). In terms of fertility, light grey forest soils are very heterogeneous. Strong opisolisation of light grey soils has affected their physico-chemical properties. The content of humus in the upper horizon of loamy soils is 1.3-2.0%, on average 1.7%. Depth of humus (humus-eluvial) horizon makes 15-20 centimeters which then passes to eluvial by depth of 5-8 centimeters and under eluvial the illuvial horizon which is very deep, brown or dark brown is formed. The reaction of the soil solution in these soils is acid (pH 4,8-5,3), hydrolytic acidity is high (1,9-2,7 ml Eq. per 100 g of soil) with saturation degree of divalent cations 60-80%. Grey podzoled soils have been formed in places with minimum GTC V-IX = 1,17-1,20 caused by climatic factors as well as by relief due to additional accumulation of moisture by sewage water up to GTC V-IX = 1,80, under broad-leaved forests with grass vegetation projective cover of 45-65%, mainly on loess rocks. Most widespread in the region, occupying 29.2% of the area. They occur in the central elevated, most dissected part of the region. These soils have formed under forest vegetation, dominated by oaks and hornbeams, mainly on forested slopes and loess-like loams. According to mechanical composition the varieties of grey ashed soils vary within the region from sandy loam to light loam. In a profile of gray forest soils are distinguished horizons: NE - humus-eluvial (thickness 25-35 cm); IN - siltstone markedly humus (15-20 cm); AND - siltstone and P - parent rock from a depth of 100-150 cm. Grey podzoled soils differ from light grey podzoled soils by absence of morphologically distinct eluvium. The washed-out types are confined to high and middle-opaque ridges and high loess terraces, where they occur on watersheds and their slopes. The soils are characterized by less distinct, in comparison with their non-zmitic analogues, differentiation of profile by eluvial-illuvial type, without pure eluvial horizon (E (gl)). Slabozmiti varieties are widespread on gentle slopes of watersheds. In these soils about half of humus-eluvial horizon is washed away (HE (gl)). The top part of the illuvial horizon (Ieh (gl)) is often attracted to the arable layer, which makes the arable surface lighter than in non-smooth soils, intensively swamped, with a denser crust.

Dark grey forest podzolised soils. It was formed in places with minimum GTC parameters V-IX = 1,05-1,16, which are caused either by climatic factors or relief due to additional moistening in regions with lower hydrothermal parameters, in GTC V-IX = 1,80 under broad-leaved forests with projective cover of grass vegetation 65-75%, so it has weakly expressed signs of opidzolennia and well humusogromadzhennya - mainly on forests and loess-like rocks. Horizons are distinguished in its profile: NONE - humus- visibly eluvial with the presence of a sprinkling of silica (thickness 25-35 cm), in virgin variants the structural composition is granular-crusty or horhovate-grained, in developed ones it is powdery-crusty; NO - humus-illuvium (25-30 cm), horichuvate, large amount of silica powder on structural faces; IN - illuvium is visibly well humus-coated (15-20 cm) lumpy-richuvate or horichuvate-prismatic; AND - illuvium is lumpy-prismatic and P - mother rock from the depth of 110-130 cm. In humid (GTC V-IX = 1,70-1,80) and moderately humid (GTC V-IX = 1,50-1,60) regions dark grey podzolated soils are of viscous species, gleying is well expressed in the lower part of

the profile, starting from iluvium, as spots of brown, brown-ochre, ochre, black spots, olive and grey sections. In other regions (behind humidification) they practically do not have signs of gleying, in some regions R2O3 penetration on structural separations in iluvial and pechitic to soil-forming horizons is observed. Carbonates are usually in mother rock but can be sporadically present in lower part of profile as their mobile form. These soils are characterized with maximal intensity of humus formation in highly humidified regions (HtK V-IX = 1,40-1,50). Dark-grey slightly zemitic soils are found on gentle slopes of watersheds, the humus eluvium horizon is up to half washed away (Fig. 2.17, supplement M.6). Ploughland surface is more waterlogged and fractured than in non-zmitic soils. Medium zmitich varieties occur mainly among weakly zmitich soils, often in complex with strongly zmitich ones. They are mainly found on sloping slopes. The humus-eluvium horizon (Not (gl)) and partly the humus-eluvium (HI (gl)) are washed away, the arable surface is clearly brown, spotty, intensively swamped, fractured, with a dense crust. Strongly zmithy varieties are mostly found in small patches among the medium zmithy varieties. They are confined to undulating and steep slopes, watersheds. The humus part of the profile is washed away (Not (gl) + HI (gl)), to the arable layer silt horizon is involved (I (gl)). The arable surface is brownish, swampy, fissured, with dense kirkyuRozpovdzheni in Mogilev-Podolsky Prednestrovye and South Pobuzhye. These soils cover an area of 345.3 thousand ha or 17.4%. Generally, these soils occupy the Murovani-Kurilivtsi - Tomashpil-Tulchyn-Tvertynivka-Zyatkivtsi area. Their origin is associated with dispersal of woody and herbaceous vegetation. Compared with grey podzolised soils, they are characterised by a lower degree of podzolisation and have medium and heavy loamy soils, while in the extreme south they have light loamy soils. By fertility dark grey podzolised soils also belong to the best in Ukraine. Due to deterioration of physical and physical-chemical properties relative to podzoled black soils, their productive capacity slightly decreased despite of better moisture conditions, but they are not inferior to typical black soils. As for other soils, they are characterized by a pattern of productivity growth with heavier granulometric composition. Humus content in dark grey podzoled soils is much higher than in strongly podzoled ones (2,5-3,2% in arable layer of loamy distinctions), at that its amount decreases not so sharply with depth. In the 0-30 cm layer its average content is 2.77% (112 t/ha). The content of absorbed bases is 13.0 - 20.5 mg.eq. per 100 g of soil. Acidity of dark grey podzoled soils: pH 5.6-5.8, hydrolytic is 2.2-3.2 mg.eq. per 100 g of soil. The saturation of divalent bases in the absorbing complex of these soils is 82-90%. Physical properties of dark grey podzoled soils are better than those of strongly podzoled ones. Loamy varieties of these soils are characterized by better water-air regime. Though their top horizons have non-water spread structure, it causes swamping of soil and formation of crust, though in less extent than in gray and light gray podzoled soils. The nutrient regime is also better in strongly podzoled soils. The content of hydrolysed nitrogen is 6.5 - 8.0 and potassium 14-15 mg per 100 g of soil. To obtain high and stable yields of crops in podzoled and especially strong-podzoled soils it is necessary to apply increased doses of organic and mineral fertilizers (nitrogen and potassium). In addition, unsaturated soils need liming, measures to combat swelling and crust formation, apply a set of anti-erosion measures - agrotechnical, and, if necessary, hydraulic and agro-forestry amelioration. These soils are suitable for all crops that grow in the forest-steppe zone. Only gray and light gray soils are not suitable for the cultivation of sugar beet, as these soils have high acidity, low humus content, and under the humus horizon (close to the surface) is compacted iluvium horizon.

Black earth soils. Chernozems differ from previous soil types by their dark grey colour, granular and cloddy structure, gradual transitions between genetic horizons, and a clear carbonate horizon. The presence of complex microaggregates (to IV and V order) of mainly coprogenic-coagulative type, separated by a system of pores, uniform humus content, which gradually decreases with depth, very low content of non-aggregate material and the presence of various microforms of calcite are noted in their microbuds [5]. The characteristic of the carbonate and humus profiles is the basis for dividing chernozems into forest-steppe (podzolic, leached, typical) and steppe (common and southern). In the direction from north to south the thickness of humus horizon decreases, while the depth of carbonate horizon significantly increases. Forest-steppe chernozems are characterized by high intensity of humus-accumulative process (complex microaggregates of III-IV order, mainly of coprogenic origin, few plant remains have different stages of decomposition, dark-colored humus prevails, isotropic zone with subordinate development of isotropic-anisotropic zone). The microhabitats of the transition horizons combine micro-parts of the humus horizon with micro-parts of anisotropic clayey and carbonate-clayey plasma. The clayey plasma can have naivkoloporovi and naivkoloskeletni compartments. In podzolized and leached chernozems there are pockmarks, in typical chernozems there are sometimes thin pockmarks. The forest-steppe chernozems are characterized by a complex and dynamic carbonate profile, characterized by needle-like fine and micro-crystalline forms, in typical chernozems all micro forms of calcite are observed. A characteristic feature of the forest-steppe chernozems are ferruginous and ferruginous-manganese neoplasms (spots, microortsteins, etc.) in the lower horizons, which is explained by their modern over-moistening. Micromorphological chernozems are characterized [5] by complex aggregation of humus-accumulative horizon, its dark colour, the presence of a system of branched pores. Of plant residues prevail fresh, zoogenic recycling of soil mass is very significant, coprolites are small in size. In soils the share of spongy material, relatively unaggregate and aggregates increases, transitional horizons are more easily constructed, they combine widow humus and carbonate horizons, as a rule, due to mechanical, zoogenic mixing. The form of the clay matter is not characteristic of the pervasive and naivkoloporovoi

forms. The mineral skeleton grains are densely packed in humus-carbonate plasma and have humus shells. The profile of carbonate nodules is considerably simplified. Microcrystalline calcite predominates and is mostly uniformly impregnated in the plasma. Micromorphological southern chernozem differs from ordinary chernozems in the growth of zoogenic recycling of soil mass. In ordinary chernozems microaggregates are of co-cogenic and coagulative origin, in southern chernozems they are of coagulative, phytogenic and zoogenic origin. So, as intensity of podzol formation decreases from north to south and influence of soddy podzol (humus accumulative) and carbonation increases, soils can be arranged in the following row: sod-podzolic - light grey forest - grey forest - dark grey forest podzolised - podzolised chernozems - leached chernozems - typical chernozems - ordinary chernozems - southern chernozems. Black earth is a zonal type of Vinnitsa region and takes the second place by the area of spreading after grey forest podzoled soils. The area is 830,8 thousand ha or 42,1%. The main area of their distribution is in the north-east, south-east, south of the region. They constitute the basic land fund in Khmelnykivskyi, Kalynivskyi, Koziatynskyi, Lipovetskyi, Pogrebyshchenskyi, Teplikskyi, Bershadskyi, Chechelnitskyi, Peschanskyi, Kryzhopolskyi, Orativskyi and Yampilskyi districts. Among chernozems within the region are subtypes of podzolic, regraded and typical.

Peatlands. On the territory of Vinnitsa region in different types of peatlands are found only lowlands. Most of them are in the floodplains of the rivers Bug, Zgar, Riva and within the borders of Letychivska plain, near Berezovka. The total area is 7.2 thousand ha, i.e., 0.4%. Peat is formed by anaerobic accumulation of weakly boggy organic mass. Reaction of soil solution is neutral or slightly alkaline. The use of these potentially fertile soils for agriculture is hindered not only by poor water-air regime, but also by the presence of toxic iron and aluminium compounds. To improve the soils, it is necessary to regulate the water regime and apply mineral fertilisers: in the first years after drainage, full mineral nutrition, and later potassium and micro-fertilisers with copper. Only then they will be suitable for growing hay, vegetables and fodder crops. Soils are mainly spread in Mohyliv-Podilskyi and South Pobuzhye. They lie in a peculiar group of soils, which have retained the name of mocharic (if the intense excessive moisture is seasonal) and mocharny (if it is permanent). Area of these soils is big enough and amounts 33,3 thousand hectares or 1,7%. Grey and dark grey podzoled mocharny soils - 12,3 th.ha, podzoled mocharny and mocharny chernozems - 14,2 th.ha and podzoled mocharny soils on compacted clay, that are located in southern part of the region are distinguished among soils of this group. This group of soils is distinguished by strong overwetting, gleying of rocks and lower part of iluvial horizon. Their profile is characterized by structureless, compacted and fused formation. Humus and nutritive content in the podzolated mossy soils is no less than in typical soils (humus content is 3.5-4.5%, phosphorus about 10 mg per 100 g of soil, potassium content 14-15 mg per 100 g of soil). However, their physical properties are not satisfactory. To improve them it is necessary to carry out drainage, liming, application of organic and mineral fertilizers and necessarily appropriate treatment. Profiles of the main soils of Vinnitsa region are presented successively in appendix M in the context of the main typological groups of the region.

Alkaline-marsh and marsh soils. Spread in depressions of relief on plateau and floodplain terraces, where groundwater is shallow (1.0-1.5 m) and surface runoff water stagnates periodically for a long time (20-30 days). They are formed under meadow-marsh grass vegetation in conditions of constant capillary connection with groundwater, resulting in its lush development and high intensity of humus accumulation. Profile structure: Hd - humus sod horizon up to 5-7 s m; H (gl) - humus horizon 20-40 cm thick, dark grey, almost black in wet condition, mostly puffy-brown, sometimes with isolated rusty-brown streaks and spots due to sporadic anaerobiosis; HPGL - Ogley transitional horizon 10-25 cm thick, greyish-grey or greyish-olive; soil-forming rock strongly Ogley, greyish or olive-coloured, saturated with water. When groundwater, rich in calcium, discharges, marls are formed in the transition horizon and parent rock [5]. Alkaline-swampy and swampy soils are widespread in floodplains of rivers, weak and closed depressions of terraces. They occupy 28.7 thousand hectares (1.5%) and 14.6 thousand hectares (0.7%). Formed in conditions of excessive humidification, caused by high level of ground waters (sometimes they can stand on the surface). Over-wetting and lack of oxygen in alkali-marsh soils have led to the fact that plant remains are not completely decomposed, but accumulate in the form of coarse humus. In the upper horizon of loamy varieties of these soils the content of humus is 5%.The reaction of the soil solution is close to neutral. These lands can be successfully used as hayfields or even for vegetable growing but with obligatory regulation of the water regime. Swampy soils are spread, like the previous type, mainly in the depressions of the relief. They are formed under grassy swamp vegetation represented by reed, cattail and other hydrophytes, sometimes with woody species such as alder, willow and others. Compared to alkaline-marsh soils, it is characterized by pronounced signs of gleying throughout the profile, which is caused by a higher groundwater table (0,5-1,0 m) and prolonged stagnation of surface water (more than 30 days). The granulometric composition of marsh soils varies from loamy-sandy to light clayey, but loamy and light clayey soils predominate. Profile structure: Hg (t) - humus-derny horizon 5-10 cm thick, often rusty-brown, with a ferrous film on the surface; HG1 - humus-gley horizon, 25-45 cm thick, dark grey with bluish tint, in wet condition glossy-black, with rusty-ochre spots and stripes; PHGL - transitional glaze - 15-35 cm thick, dirty greyish-blue or greyish-olive. Deeper is the bedrock, which is often saturated with moisture due to the high groundwater table. When forming on carbonate bedrock and groundwater discharges in depressions of relief carbonate types are formed, often with presence of marlysed spots in Ogleying transition horizon [6]. For marsh soils the characteristic feature is intensive waterlogging which is traced in Ogleying along the whole

profile from top to bottom. These soils accumulate 10% of coarse humus and the reaction of the soil solution is also close to neutral. Swamp soils are unproductive forage lands, overgrown with reeds, although these soils of loamy or clayey texture have large reserves of nutrients. The regulation of the water-air regime makes it possible to use marsh soils as highly productive hayfields or areas for vegetable gardens.

Thus, given the opinions of various studies and the results of practical experience for the conditions of Vinnitsa will be differential system of cultivation, which will be based on monitoring of soil fertility conditions, long-term evaluation of factors of fertility climate, the typological specialization of crop rotations or compliance, conversely, elements of zminnosti and monoculture given the technical equipment of enterprises. At the same time, it is necessary to take into account the dynamics of changes in the soil cover of a particular region with regard to the intensity of degradation processes and the level of damage caused by them as noted in the studies of A.A. Korchinskaya [7].

Consequently, conservation of soil cover of Vinnitsa requires a certain reformatting of zonal farming systems in the context of their adaptability and flexibility both to the real situation of soil regimes and properties and to the modern challenges of agricultural technology development, machinery of technical support, climate change and genotypic characteristics of varietal and hybrid composition. In this respect, foreign developments should not be blindly copied and foreign machinery should not be used recklessly.

References

1. Ahrarnyi sektor ekonomiky Ukrainy (stan i perspektyvy rozvytku)/ [Prysiazhniuk M. V., Zubets M. V., Kabluk P. T. ta in.]; za red. M. V. Prysiazhniuka, M. V. Zubtsia, P. T. Sabluka, V. Ya. Mesel-Veseliaka, M. M. Fedorova. K.: NNTs IAE, 2011. 1008 s.

2. Tsytsiura Ya. H., Pelekh L.V., Bronnikova L.F. Hruntovyi pokryv Vinnychchyny: henezys, sklad, vlastyvosti ta napriamky efektyvnoho vykorystannia (monohrafiia). Vinnytsia: TOV Nilan – LTD, 2018. 452s.

3. Elektronnyi resurs. Rezhym dostupu: http://www.imbf.org/ tools/images/karta-osobocennyh-pochv-ukrainy.jpg.

4. Elektronnyi resurs. Rezhym dostupu: http://map.land.gov.ua/ kadastrova-karta.

5. Elektronnyi resurs. Rezhym dostupu: https://uk.wikipedia.org/ wiki/Chornozem.

6. Zapolskyi A.K., Saliuk A.I. Osnovy ekolohii: pidruch. K.: Vyshcha shkola, 2001. 358 s.

7. Korchynska O.A. Rodiuchist gruntiv: sotsialno-ekonomichna ta ekolohichna sutnist: monohrafiia. K.: NNTs IAE, 2008. 237 s.

VOL 1, No 70 (2021)

Sciences of Europe
(Praha, Czech Republic)

ISSN 3162-2364
The journal is registered and published in Czech Republic.
Articles in all spheres of sciences are published in the journal.

Journal is published in Czech, English, Polish, Russian, Chinese, German and French, Ukrainian.
Articles are accepted each month.
Frequency: 24 issues per year.
Format - A4
All articles are reviewed
Free access to the electronic version of journal

«Sciences of Europe» -
Editorial office: Křižíkova 384/101 Karlín, 186 00 Praha

E-mail: info@european-science.org
Web: www.european-science.org