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FEATURES OF FOREST-MELIORATE INVENTORY OF PROTECTIVE FOREST PLANTATIONS OF LINEAR TYPE

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The peculiarities of agroforestry inventory of protective forest plantations of linear type and arranged in strips channels, railways and roads are described in the article. Attention is focused on the basic parameters are taken into account in the forest management of such facilities and the measurement of their condition.

Key words: agroforestry inventory, protective forest plantations of linear type, agroforestry survey, forest measurement works, assessment of stands.

At present the actual remaining issues related to the preservation and restoration of land and resource potential of Ukraine, protection of land degradation, loss of environmental forming functions, environmental stabilization of agricultural landscapes. The value of protective forest plantations of linear type in a flat part of the territory of Ukraine is determined by the simultaneous performance of a number of important ecological functions. According to the Law of Ukraine "On land reclamation " to ensure the formation of multifunctional melioration systems should be used all kinds of protective forest plantations, including linear type, providing protection from wind and water erosion and improving soil and climatic conditions of agricultural lands by development of windbreaks and water regulation strips [3]. Importance in the system of protective plantations of linear type is given to those placed in the channel strips, railways and roads. The latter, along with the protection of canals and roads, and cause significant favorable microclimatic changes in the environment and positively affect the operation of other components of agricultural landscapes. The Law of Ukraine "On the State Program of the National Ecological Network in Ukraine for 2000-2015" defines the linear plantations as natural corridors should provide for the environmental conditions of continuity, unity and bio communication system [2, 1 , 7].

The effectiveness of linear plantings protective functions entirely depends on their optimal location, species composition and the overall state of forestry. These properties can be set only during agroforestry arrangement of protective forest plantations. Until recently, in the course of such work guided "instructional requirements of agroforestry arrangement of protective forest plantations" [5]. Practical application of these requirements in agroforestry ordering revealed the need to improve certain provisions. Due to the feature of the growth and development of protective plantations of linear type and arranged in strips channels, railways, highways there is a need to develop guidelines on their agroforestry arrangement [8].

The purpose of research – the improvement of existing and development of new guidelines for carrying out forest management in protective forest plantations of linear type and arranged in strips channels, railways and roads.

Materials and methods of research. As starting materials for the development of guidelines used existing instructional requirements of agroforestry arrangement of protective forest plantations, scientific developments Department of Forestry and Optimization of Forest-Agricultural Landscape of NUBiP Ukraine of forestry-meliorate assessment of these facilities, and long production experience state enterprise "Ukrderzhlisproekt" with forest inventory papers [5, 6, 9]. In developing the guidelines used forest measurement methods of researches, forest melioration research methodology assessment of linear spaces and perform their protective functions. Analytical method of processing and synthesis of theoretical and practical material allowed formulating proposals for the development of these guidelines.

Results. Features agroforestry arrangement of protective forest plantations of linear type lies in the fact that while forest inventory additional work carried agroforestry examination of such objects. The card inventory to a single layout "Characteristics of protective forest plantations of linear type" in addition to measurement works add separation characteristics, the digital codes in accordance with the classifiers indicated their agroforestry details:

1. Type of protective forest plantations of linear type.
2. Ordinary number of windbreak.

3. Length of windbreak, m.

4. Width of windbreak, m.

5. Number of rows.

6. Construction of windbreak.

7. Assess the appropriateness of placing belts.

8. Forest-melioration assessment.

In layout of explanatory note assesses the state (as a class) of protective forest plantations on a scale linear type (Table 1).

1. Scale of assessment of protective forest plantations linear type

Classes as (quality class)	The percentage of healthy trees of total*	Number ** healthy trees per 1 ha by age periods, thousand units											
		Types and subtypes of soils											
		ordinary chornozems			South chornozems			dark-chestnut and chestnut			light-chestnut		
		1	2	3	1	2	3	1	2	3	1	2	3
1	не менше 75%	3,0	1,7	1,1	2,5	2,0	1,0	2,0	1,4	0,8	1,5	1,1	0,6
2	74-51	2,3	1,3	0,8	1,9	1,5	1,7	1,5	1,1	0,6	1,1	0,8	0,5
3	50-26	1,6	0,9	0,5	1,3	1,0	0,5	1,0	0,8	0,4	0,7	0,5	0,4

*) In mixed stands of the main species is at least 50% of healthy trees. Planting trees with having a healthy 25% or less related to the victims.

**) Relating to healthy trees that are in the crown of not more than 10% of dry branches.

The following scale makes it possible to define a class as the percentage of healthy trees of the total number and the types and subtypes of soils. For a complete description of linear spaces is important to have their forest-melioration assessment in accordance with the qualitative stages of their growth and development [6]. To this purpose, it is developed the scale of forest-melioration assessment of protective forest plantations (Table 2), which takes into account the stages of their growth and development, types and optimal placement, biological stability, performance and Forestry completeness and adequacy of the performance of their melioration functions. These indicators are integrated and evaluated on a 5-point scale.

2. The scale of forest-melioration assessment of protective forest plantations

Total characteristics	Assessment
Plantings IV-V stages of development of the relevant type of optimal placement and composition, biologically stable, growing of class I with the density of 0.7-1.0. Fully carry out their erosion control and other meliorate function. Are in good condition and does not require forestry or any business activities for the next revision period.	5
Plantations of II-V phases of the appropriate kind, good selection of the correct species, biologically stable, but the reasons for placement, mixing rock or other - to grow of II class and 0.7-1.0 density and need care the main species, maintenance or formation of structures (for windbreaks) or other commercial forestry activities and capable of performing the full erosion or any other meliorate functions.	4
Plantations of II-V phases of the appropriate type, failure location, composition, selection and mixing breeds that growing in the III-IV classes of growth, deranged, littered with the density of 0.4-0.6 or plantations growing in class II class, which weakened by lack of care and in need of repair or partial reconstruction to repair erosion and other meliorate features.	3
Plantings lost all developmental stages and species, or those that die due to excessive damage by cattle herds or damaged: fires, pests, pathogens that grow in classes IV-V growth density of 0.3 or less, which have poor composition, condition and location and ceased to perform erosion control and other functions melioration of solid sodding soil - in need of measures for reforestation.	2
Plantings of the I stage of development, which can not yet the time of inventory to perform erosion and other protective functions/	1

Fully correspondence - with "5" on-point scale of forestry melioration evaluation. Not require any action (samples, reference).

Correspondence enough - with an "4" and "3", describing the extent to which normal growth conditions and require different measures to improve their condition. With decreasing rate assessment of protective forest plantations and the complexity of events increases by up to use a partial reconstruction.

Do not correspondence - with estimates "2" and "1". Evaluation of "2" are placed wrong and dead – should cut down without recovery in flat relief. On sloping lands (under the threat of erosion) cleaning must be made with the use of anti-erosion measures. In plantings that die in the exercise silvicultural measures should be left healthy trees as seed to be the future multi-age structure. Evaluation "1" are promising young plantations, which require the use of farming practices for successful engraftment and their closure.

Place the protective forest plantations of linear type depending on their purpose. Area of forest strips measured at an alternative principle - the optimal or sub-optimal, which is an entry in the card inventory.

Based on the forest and agroforestry characteristics of protective forest plantations of linear type, taking into account the site conditions and to improve their quality indicators, biological stability and efficiency are assigned appropriate ameliorative measures for economic auditing period. The basis for assigning a particular economic event in the plot is its compliance with the qualitative and quantitative characteristics of certain norms and conditions under which permissible or necessary to hold this event in accordance with the applicable rules and guidelines.

In situ appointed the following types of business activities: thinning, sanitary cuttings, restoration logging, logging-related reconstruction, rehabilitation, new planting protective, measures to promote natural regeneration; agricultural and forestry care unclosed forest crops; reconstruction plantations; measures for forest protection, fire prevention measures.

Feature thinning of protective forest plantations of linear type (located in the channels, railways and highways) is that they should be carried out in three stages: the first method - forestry in care until full closed crowns plantations, the second method – forestry care during the formation of the desired structure stands, the third method - forestry care support required during construction and plantation life. Approximate ages of plantations for forestry cares are given in Table. 3.

3. Approximate ages of plantations for forestry cares

Dominant species, management	Ages forestry care, years		
	first admission	second admission	third admission
1 . Conifer, oak boled	6-10	11-30	31 і старші
2. Low grooving oak, hardwood, softwood, and other tree species with age-maturity 41 years and above	6-10	11-20	21 і старші
3. Hard deciduous, softwood, other tree species and shrubs with the maturity age below '40	3-5	6-10	11 і старші

Thinning of stands in the first age period directs to improve growth conditions the main species, release them from the oppression of the underlying rocks, achieved removal of the planting of related species or their branches that shade the main species, trimming the lower branches of trees in outer rows (to increase porosity and prevent expansion outside lane).

Thinning of stands in the second age period (during the formation of the desired structure) towards the final formation of the plants and forming in them the desired construction. Cut down dry, damaged, declined and suppressed trees and related species, preventing the growth of the main (in pure composition windbreaks – the worst plants that interfere with the growth of the best). In extreme rows the inclined trees should cut down that enhance the design width of windbreak.

Thinning of stands in the third age period is carried out in order to preserve the existing constructions in windbreaks and support their life and durability.

Conclusions

Set out in article particularity of agroforestry arrangement of protective forest plantations of linear type enable better performance of such works including: growth and development of windbreaks, optimal placement to enhance an effective protective action, execution plantations multifunctional role in the context of ecological network formation, the use of forest-meliorate assessment of their condition, mandatory use of forest measures for their content. These features should be taken into account as guidelines to develop new instructive materials of agroforestry arrangement of protective forest plantations of linear type.

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