

ANALYSIS OF MODERN SOIL TREATMENT TECHNOLOGIES

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The highest achievements of world agricultural production are provided by modern agrotechnologies of tillage, which have absorbed the centuries-old peasant experience and the latest achievements of scientific and technological progress. [1].

Agrotechnologies are primarily connected to a single system of agricultural landscape management through crop rotation, tillage systems, fertilization and the use of plant protection products. The most important trend in improving tillage is its minimization. The use of minimum and zero treatments helps to reduce evaporation from the soil surface by reducing the aeration of the arable layer and the mulching effect of plant residues with a sufficient amount of them. Thanks to the mulch, condensation moisture is more efficiently used. Straw mulch has a beneficial effect on the thermal regime of the soil in the southern regions [2, 3, 4].

The big advantage of the minimum processing, especially zero, is fuel economy, cost reduction, work in a short time, the release of time from producers. However, with all the advantages of trenchless and flat-cut soil treatment systems, they have certain disadvantages. First of all, from these drawbacks - this is an increase in the contamination of crops, especially with increased moisture.

The most important direction in minimizing tillage is the combination of technological operations. The economic effect of their use is to smooth the so-called peaks of the need for energy resources and labor resources. This reduces the cost of material and labor resources for the cultivation of crops [5, 6, 7, 8].

The general trend of minimizing tillage does not mean the widespread abandonment of the plowing system, especially in areas with increased soil and landscape mois-

tening, where improvement is necessary. It should be noted that the reckless propaganda of zero or minimal tillage cause agriculture no less damage than traditional conservatism, ignoring the soil-protective treatment systems.

The most important requirement for agricultural technology is energy saving. Specialists who are passionate about minimal and, moreover, zero tillage, concentrating on saving mechanical energy, may not take into account the increase in costs of other types of energy, for example, in pesticides or mineral fertilizers. As a result, the energy consumption of zero tillage can be significantly greater compared to traditional ones.

Another erroneous opinion may be the assignment of intensive agrotechnologies to high-energy-consuming due to the active use of agrochemical resources. Therefore, any reasoning on this issue can be correct only on the basis of calculations of the specific energy consumption per unit of production. The role of a technology intake or a chemical product is only revealed when taking into account the structure of these costs and analyzing the alternative.

References

1. Saitov V.E., Kurbanov R.F., Sozontov A.V. The state and prospects of development of engineering and technical services of agricultural enterprises. *Sovremennyye naukoemkie tekhnologii*. 2016, No 6 (1), pp. 70-74 (in Russ.).
2. Kurbanov R.F., Saitov V.E., Khodyrev I.N. The method of extending the production longevity of crops of perennial legumes. *Uspekhi sovremennogo estestvoznaniya*. 2016, No 8, pp. 98-103 (in Russ.).
3. Saitov V.E., Gataullin R.G. Trailed wide grip combined sowing complex «AGRAER-850H». *Traktory i sel'khoz mashiny*. 2015, No 1, pp. 12-14 (in Russ.).
4. Saitov V.E., Gataullin R.G., Savinykh P.A. *Razrabotka i issledovanie resursosberegayushhego posevnogo kompleksa* [Development and research of a resource-saving seeding complex]. Saarbrücken, LAP LAMBERT Academic Publ., 2016, 166 p.
5. Saitov V.E., Kurbanov R.F., Sozontov A.V. *Sovremennyye ehnergosberegayushhie posevnyye kompleksy* [Modern energy-saving sowing complexes]. Saarbrücken,

LAP LAMBERT Academic Publ., 2018, 73 p.

6. Saitov V.E., Gataullin R.G. Improving the efficiency of the energy-saving seeding complex. *Mezhdunarodnyj zhurnal ehksperimental'nogo obrazovaniya*. 2014, No 12, pp. 62-63 (in Russ.).

7. Saitov V.E., Gataullin R.G., Nigmatullin I.N. *Ehnergoberegayushhij pritsepnoj posevnoj kompleks* [Energy saving trailed sowing complex]. Patent RF, no. 2535752, 2014.

8. Saitov V.E., Gataullin R.G., Kurbanov R.F., Saitov A.V. *Ehnergoberegayushhij pritsepnoj posevnoj kompleks* [Energy saving trailed sowing complex]. Patent RF, no. 2636975, 2017.