

Problems of Improving the Softening Structure of the Base Level and Its Solution

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Abstract— *In this article, the topical issue is to improve the level of land leveling, to carry out its quality leveling works and to create a high-efficiency leveling aggregate for these works. The aim is to improve the quality of work of small base levelers used in the current leveling of farmland, to prevent soil compaction by forming a crop layer of soil after leveling and reducing the number of transitions, and to study the dependence of the plane on tractor-machine units.*

Keywords— grader, spherical disc, speed, tensile strength, soil size, fraction, leveling quality. water saving, furrow irrigation, innovative technologies, the mechanic, long-base scheduler.

1. INTRODUCTION

The world and domestic practice of agriculture has proven that the leveling or leveling of the surface of the fields is the main reclamation measure designed to eliminate the irregularities in the sown plots in the form of various hanging and lowering. Land surface grading provides the basis on which irrigated agriculture can develop properly with a steady increase in crop yields. Field planning is an integral part of both land reclamation construction and agricultural production. This is one of the effective agrotechnical measures that ensure an increase in the yield of all agricultural crops, a decrease in water consumption during irrigation and an improvement in working conditions during the subsequent operation of agricultural machinery. Carrying out mechanized agricultural work at a high agrotechnical level is possible only on planned fields, especially with the use of improved wide-grip high-speed implements. Irregularities on the surface of the field lead to rapid wear of the machine and tractor units.

2. MAIN PART

To ensure the high quality of the ongoing technological processes, including irrigation, it is necessary to pay special attention to the capital planning and the obligatory periodic implementation of the operational planning of the fields.

After carrying out the capital planning in all cotton growing zones, to maintain the field surface in a state that meets the requirements of surface irrigation, every two to three years of its operation, it is necessary to carry out continuous periodic operational, that is, repair - restoration planning on the previously plowed soil. Before the operational planning, large irregularities formed on the irrigated area should not exceed 25-30 m in width at the base, and not more than 200 mm in height.

With such a layout, the layout project is not drawn up, but a control level survey is carried out and the task is set to cut off the elevations of the soil and move them to lower places. Large plant residues must not be left on the field, because they will hang on the planer's working body and worsen the stability of its course in depth. As a result of the leveling, the field should not remain uneven with a height of more than 50 mm. The state of the surface of irrigated lands is almost everywhere unsatisfactory, which reduces the efficiency of sprinkling, and the use of surface irrigation makes it almost impossible. Irrigation by surface irrigation and sprinkling requires preliminary preparation of land. The rational use of irrigated lands depends on the preparation of fields for irrigation, consisting of work on leveling the surface, leveling, setting up a temporary irrigation network and cutting the irrigation network. Significant shortcomings in one of the types of work negatively affect the yield of agricultural crops. The leveling of the land surface provides better conditions for soil cultivation, the uniformity of its maturation and, as a consequence, the uniformity of the emergence of agricultural crops, water savings, higher resistance to the development of erosion processes and a number of other advantages compared to an unplanned surface. All these factors ultimately increase the yield of crops from 10-15 to 1.5-2 times. The economic feasibility of planning works is confirmed by a number of experiments by both domestic and foreign scientists. It has been proven that planning is necessary even if its costs are close to the capital investments associated with the organization of irrigation of fields. Crop yield losses are in direct proportion to the complexity of the microrelief, the more complex it is, the lower the yield. During the operation of irrigated agricultural lands, a change in the surface microrelief is observed both in areas occupied by sprinkling and those occupied by surface irrigation.

Planning works are preceded by engineering surveys, which are the basis for making a decision on a specific irrigated area, and design. Therefore, on newly commissioned irrigated areas, during the reconstruction of irrigation systems and when transferring, where appropriate, areas from sprinkling to surface irrigation, which for a number of reasons is currently relevant, it is necessary to carry out geodetic survey of the surface as provided for by regulatory documents. And its use in topographic and

geodetic surveys of modern high-precision and reliable laser transmitters allows you to automate the process and increase labor productivity when shooting.

The combination of the advantages of using laser transmitters with a computer opens up new possibilities in surveying the surface of the field and allows obtaining topographic plans in electronic form for further processing and use in design. A logical continuation of the existing topographic plans of irrigated areas in electronic form is the computer-aided design of planning works, given that computerization is one

It is known that the current and operational leveling of lands in irrigated arable lands annually short-term 35... 40% of the total land area of farms before sowing in autumn and spring with long base P-2,8A, P-4, PA-3, PPA -3,1 and other types of earth levelers [3]. Leveling of irrigated lands .-. To increase the productivity of agricultural crops, to prevent labor and water wastage during irrigation, to provide high-quality inter-row tillage and machine harvesting. creates conditions for its implementation.

Repeated tillage and irrigation result in a variety of irregularities in the fields: long ridges and furrows during plowing, highs and lows after irrigation, and residual unevenness from the previous year. In addition, in some parts of the area, repeated irrigation can lead to subsidence of the soil. All such irregularities can be eliminated by applying the current (operational) leveling in the process of preparing the area for planting. The current (operational) leveling process should be carried out in a short agro-technical period. The current shortage of long-base leveling machines on existing farms and the change in the geometric shape of existing leveling softeners make it difficult to carry out current leveling in a timely manner.

3. CONCLUSION

This problem can be solved by improving the smoothing device of long-base leveling machines and increasing productivity.

Studies have shown that when the speed is increased to 8.5 km / h, the smooth movement of the leveler and the uniform grinding of the blades increase the level of leveling and ensure the quality of the ground. If the speed of the leveler exceeds 8.5 km / h, the vibration of the machine frame will increase, which will negatively affect the quality of work of the leveler. This increases the resistance of the working body to falling and rising above the norm. This leads to a greater change in gravity. This causes a large change in the size of the bucket prism. As a result, the quality of the plane of the field is degraded, resulting in unevenness [3]. Much research has been done in Central Asia to substantiate rational processing technology to improve the smoothing device of long straighteners. This research has shown that as a result of multiple passages, the topsoil becomes denser and harder, reducing the productivity of the unit. These deficiencies are common, especially in areas with small contours.

Based on the above comments and a number of scientific studies, it can be said that the softening device needs to be improved to increase the working efficiency of the long base leveler and further improve the quality of its leveling and reduce the tensile strength.

This can be achieved by using a soft disk drive. The main function of the disc device is to reduce the shear resistance of the leveling blade in areas that have not been pre-softened and have large grooves, to create a field surface plane that meets the agro-technical requirements in 1 pass along the field surface. Quality leveling of the fields and improvement of the soil fraction is carried out by installing a softening disc device in front of the leveling bucket. If the disk device mounted on a long ground leveler is used in practice, the ecological significance and physical properties of the natural structure of the soil will be improved, and soil fertility will increase. It allows you to reduce the cost of agricultural work and leveling processes, as well as the cost of production by a certain percentage. In mechanized and improved agriculture, the quality of work done on leveling irrigated lands will be improved, and irrigation costs will be reduced. Improves soil structure and increases productivity for plant growth. It can be concluded that this is the result of the positive impact of the leveler on the soil ecology.

The main problem of agriculture today is low energy consumption and high yields. The growing demand for energy means that the problem needs to be addressed sooner. Therefore, it is advisable to use the power of the equipment efficiently, improve the quality of work and minimize the negative effects of the work performed. Taking into account the above considerations, if the quality of irrigated lands is leveled, the reclamation condition of lands will improve. This, in turn, increases the productivity of arable land.

4. REFERENCES

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