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AGRICULTURAL SCIENCES

CLASSIFICATION AND ANALYSIS OF THE STRUCTURES OF TILLAGE WORKING BODIES

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Uprooting machines can be divided into the following subgroups:

- machines with rope traction;
- machines that uproot stumps by translational movement;
- machines that uproot stumps by teeth or levers with combined movement;
- combined uprooting machines.

Rope devices for uprooting consist of a steel cable with a hook. The cable is fixed with a loop around the stump, the other end is attached to the tractor. Uprooting is carried out by the tractor's traction force. In addition, to create traction force, it is possible to use uprooting winches driven by the PTO.

Machines that uproot stumps by translational movement are a trailer frame that moves on wheels or skis. 3 - 5 rotors are installed on the frame, each of which has hooks-teeth fixed at an angle of 120-180°. While the tractor with the trailed stump grinder is moving, one row of each rotor is deepened into the soil, loosens the soil and uproots stumps and roots. When a shaft of a certain size is formed in front of the teeth, the locking device is released, the rotors are rotated by 120-180°.

Advantages: significant productivity, simplicity of design, low metal consumption.

Disadvantages: small uprooting depth (up to 30 cm), small diameter of

uprooted stumps (16 - 20 cm).

Machines that uproot stumps with teeth or levers with combined movement (reciprocating movement and lifting) can be attached both from the front and from the rear.

On machines with a front location (stumpers and stump grinders-collectors), a frame or a shield-share is used as a working body. Teeth are installed on the frame or shield or nests are made in the lower part, in which 3 - 10 replaceable teeth are fixed.

Rear-mounted stump grinders have hooks or levers. On the rear frame of hook stump grinders, 1 - 3 hooks are placed, the lifting and deepening of which is regulated by a hydraulic cylinder. To uproot, they drive up to the stump from behind, deepen the hooks under the stump or root system and uproot the stump with the traction force of the tractor with simultaneous lifting of the hooks. Lever stump grinders uproot stumps with double two-armed levers installed on the rear frame of the stump grinder.

Advantages: cyclic action machines with combined movement of the working body use vertical and horizontal uprooting force, and also do not require manual labor.

Disadvantages: significant dynamic loads on the share, frame and tractor, insufficient visibility of the working body from the cabin, damage to the turf and vegetation, raking of the fertile soil layer.

Advantages: cyclic action machines with combined movement of the working body use vertical and horizontal uprooting effort, and also do not require manual labor.

Disadvantages: significant dynamic loads on the share, frame and tractor, damage to the turf and vegetation, raking of the fertile soil layer.

Along with the advantages, lever uprooters have a number of significant disadvantages. One of the most significant is low productivity when continuously uprooting small forests and stumps of small diameter, although when uprooting individual stumps of large diameter, the lever uprooter is the only machine that is able to perform uprooting in one approach. Also, the impossibility of loading a

removed stump into a vehicle with the same working body requires the use of additional equipment.

Conclusions

1. During the restoration of forest plantations, in places of previous fellings, as well as when clearing areas for forestry lands and infrastructure facilities, stump removal works play an important role.

2. The most acceptable of the existing methods of stump removal is mechanical uprooting of individual stumps, since this preserves the fertile soil layer and causes the least damage to the ecosystem.

3. When uprooting individual stumps, the most acceptable is the use of a stump remover with digging jaws of the grab type mechanism, which allows creating significant efforts for digging the stump and allows the stump to be loaded into the vehicle using the same working body.

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