PROPOSALS ON MAKING A STAND FOR TESTING AND DETERMINING THE WORKING PARAMETERS AND ACTIVE WEAR BODIES OF VERTICAL HARROWS

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ABSTRACT

The paper prezentază active enforcement action on soil depending on operating parameters of the mechanical soil tractor and active organ. Also it presented a proposal for making a stand for laboratory test sample .Standul will include a vat in which to put different types of soil, which will support carriage supports a vertical rotor disc of a vertical transmission, an electric motor , installation wetting roller to continue asigurerea the degree of soil compaction from baseline after passing the rotor on the ground, the trolley mover and speed of travel correlation with rotor speed, tachometer, counter revolutions number.

INTRODUCTION

Harrows are machines running vertical milling operation that ensures soil loosening and shredding, chopping crop residues and manure incorporation into the soil organice.Organul work is the rotor blade driven by a transmission from the tractor PTO and can execute the entire surface tillage or strip. By varying the kinematic parameters and geometrical body can be achieved by a crumbling soil agro conformance requirements (degree of shredded uniform working depth etc.) [5,7]

Items that increases the mechanical energy necessary to drive high speed cutters are cutting soil and a considerable increase in cutting surfaces. Because plowing and harrowing calls for additional operations causes a loss of power by the tractor wheel slippage ,, the ratio of energy consumption to plow soil tillage and soil milling work can be reduced to 1: 1.5.

The disadvantages of using agricultural cutters are: - requires a higher energy than plow: 2.5 times higher in light soils and 3.5 ORIM large heavy soils; specific power consumption is estimated to working the soil rigged agricolela 20- 35 kW / m (ScripnicV., et al) [8] - paper cutter repeated destroy soil aggregates spray. Their use is well justified cudeosebire in horticulture (crops and floriculture).

Vertical rotor mills Figure 1 shows the construction of a vertical rotor.

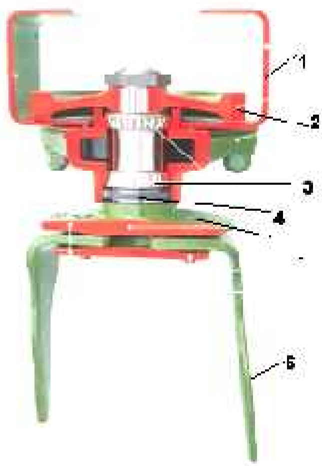

Fig.1 Construction and components of rotor blades
1-housing, 2-gear to drive the rotor, 3-bearing, 4-rotor flange; 5-şuruburi6-knife

At seedbed preparation after plowing, milling cutters with vertical rotors working alone or in aggregate with various types of rollers (with spur, helical, smooth, etc.). In most cases, these cutters are part of complex aggregates for seedbed preparation, and seeding, in a single pass on the ground. Work process executed milling vertical rotors shown in FIG. 2. During work on knife point M describes a curtailed cycloid. AB portion of cycloid cutting chip is made of ground on the depth and the additional cuţitulacţionează BC portion of the soil layer (chip off earlier), increasing soil demărunţire. It may be noted that the ground chips are not overturned or thrown, practical soil is dislodged and crushed.

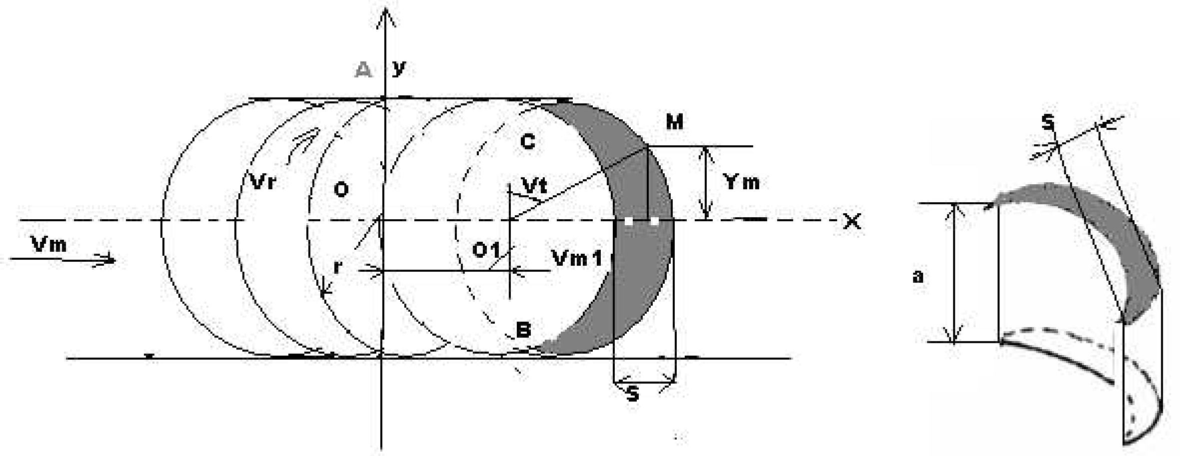

Fig.2.Traiectoria a point on the vertical rotor blade cutter with chip and soil form

During the work, a point on cuţitexecută a movement composed of rotation around the axis of the rotor angular velocity ωV = π r / vm 30 and translation speed due to machine movement. Considering that after time t 1 OO car traveling the distance and angle φ knife rotates equations cycloid axis system XOY shape:

$$X_m=V_1t+R\sin ax \quad (1)$$

$$Y_m=R\cos ax$$

where R is the radius of the cutter rotor.

The knife penetrates the soil and carried bow sawing decurbă AB. Shape chip is shown in the figure (Figure 2), and its thickness is determined by the trajectory described by two successive knives, knives which are arranged each other at a central angle ψ = 2π / z, z being the number of knives the rotor (usually two or three). Under these conditions, soil chip thickness can be calculated with relationship

$$B = V_m t = V_m 2\pi / ZV_r = V_m 60 / zn \quad (2)$$

But splinter resulting from the calculation remains immobilized between the splinter previously cut and furrow wall. It will further be comminuted into the return voyage the blade in an additional number of chips depending on the value of the kinematic coefficient:

$$\lambda = V_f/V_m = RV_r/V_m \quad (3)$$

that at high speed peripherals and low levels of machine travel speed, degree of fineness of the soil will increase dramatically.

AB portion of cycloid cutting chip is desolate, the depth "a" portion BC knife and act on additional soil layer (chip learned earlier), increasing the crushing soil. We note that soil chips are not overturned or thrown practically realizing dislocation and shredding acestora.Constatăm that the operating mode selected rotors above, considering the splinter dimensionally stable, it is cut into 13 segments of different sizes. Since the soil is friable, it will give It appears a very good crumbling soil. The disadvantage of these mills is very high energy consumption, 30- 40 kW / m, which makes you work only with tractors over 150 hp. Calculation of power for operating the mill

Research conducted in the country and prospects for the companies that build firm Curota Mills horizontal or vertical rotors, shows that the power required can be calculated with a relaţiesimpla namely:

$$P=B.P0(kW), \quad (4)$$

Where B is the width in m and P0 = 25 ... 40 kW / m (some authors go up to 60kW / m) is the power required for the working width of 1 m, depending on the depth of work and derezistenţa soil milling.

The big difference between minimum and maximum value due to soil characteristics şiadâncimii work (7- 22) cm.

OBJECTIVES:
Soil crumbling degree
The influence of velocity of the trolley
The influence of the speed of rotation of the rotor
The influence of soil moisture
Wear rotor knives depending on the different types of soil

MATERIAL:
-keyword soil (6 x0,8 x0,6m)
-support trolley
-rotor vertical transmission +
2 kW electric-Engine
-Operating wetting hydraulic nozzles
-tavălug Ø 0,3m (0,75m)
-turometru
-inregistrator operating hours
- Rotations counter number
- Displacement of the trolley system and correlation with ground speed rotor speed

WORKING METHOD
Experimental research will be conducted in the laboratory using equipment designed to be performed, presented in. (Figure 3)
It will conduct a test stand that will size (6 x0,8 x0,6m), which put the soil, will make determinations under defined conditions as regards degree of compaction, soil moisture, speed of trolley, wheel rotor speed (rpm). [1,3]
It will determine the degree of fineness of the soil influence the speed of the trolley on the size of the cut to the ground, implicit mşrunţire agradului the influence of soil moisture, wear rotor knives, after a number of hours stabilt.
The results obtained will be entered into a table.

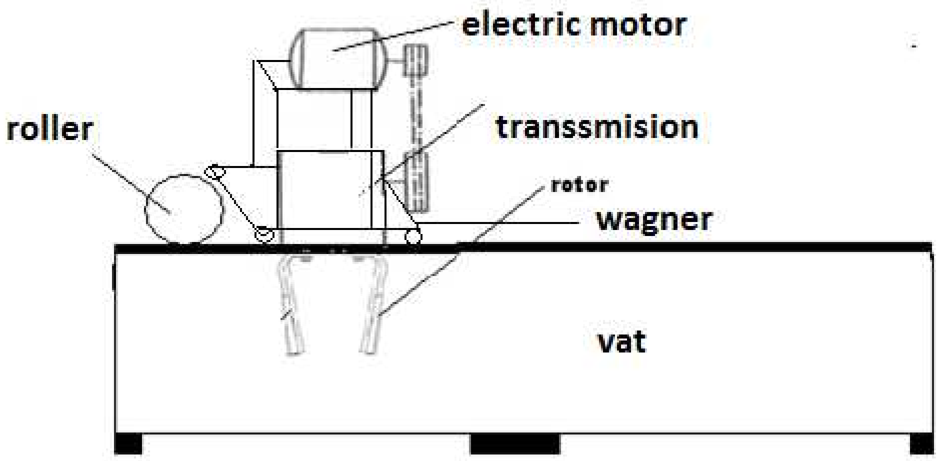

Figure 3 Schematic diagram of the stand

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