ASPECTS RELATED TO EQUIPMENTS PRODUCED ON NATIONAL LEVEL USED TO PREPARE GERMINATIVE LAYER

ASPECTE PRIVIND ECHIPAMENTELE REALIZATE PE PLAN NAȚIONAL PENTRU PREGĂTIREA PATULUI GERMINATIV

Mircea BĂDESCU, Adrian MECA, Sorin BORUZ

University of Craiova
Corresponding author: Sorin BORUZ, e-mail: sorinboruz_agr@yahoo.com

Resume: *This work reveals aspects related to technologies and equipments used to prepare germinative layer in our country.*

Rezumat: *În lucrare se prezintă aspecte legate de tehnologiile şi echipamentele folosite pentru pregătirea patului germinativ în ţara noastră*

Key words: *technology, equipment, harrows, combiners.*
Cuvinte cheie: *tehnologie, echipament, grape, combinatoare*

INTRODUCTION

For preparing a proper germinative layer the processing soil must be arranged in three different layers (diagram no. 1);

- an area with light clods at the surface for preserving the evaporation seeds;
- an area chipped for improve the germination**;**
- an area in depth to stimulate the rooting.

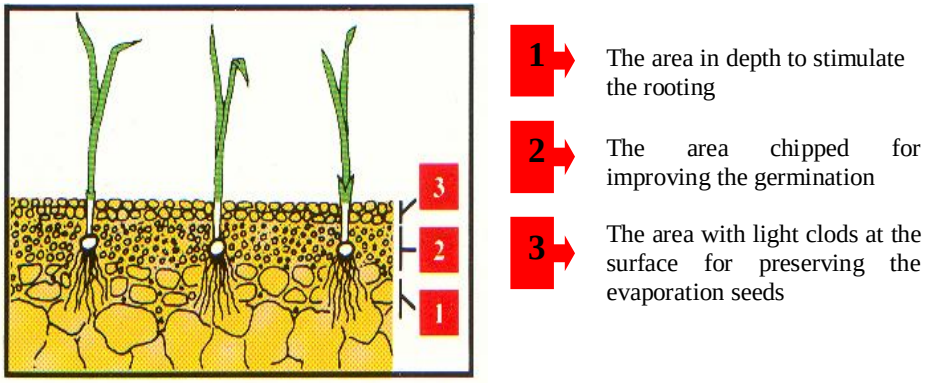

Figure 1. The arrangement of soil in layers when preparing a proper germinative layer

In spring it is recommended that in case of frozen ploughing the soil processing shall be performed only using combiners because these don't produce tilling in the operating process. It is not appropriate to use disk harrows in case of frozen ploughing, because in the operating process does not produce tilling, and at the same time a large quantity of water is lost through evaporation.

If the preparation of germinative layer is improperly performed (placed on clods), this leads to an uneven emergence of plants caused by an easy infiltration of water at the plants

roots.

In Romania the preparation of the germinative layer for the summer- autumn ploughing is performed by light disk harrows used to 65 HP working tractors and by advanced combiners or heavy harrows used to working tractors at great power.

The use of light disk harrows leads to a high fuel consumption, an increase of member team and an improper preparation of a germinative layer, taking into consideration the low humidity of soil. As a result, it is recommended to use disk harrows and shredder additional instruments for working tractors at great power in order to improve tillage technology and preparation of germinative layer on fresh ploughing in which are cultivated summer- autumn crops.

The use of heavy disk harrows leads to great results of grinding, mixing and preparation of soil performed in low humidity conditions. Heavy disk harrows cross easily the obstacles in the operating process, active device as crowned disk with a low usage degree as a result of the fact that the use during the operating process are distributed on the entire length of the knife edge.

For preparing the germinative layer on frozen ploughing combiners with operating parts conceived for grinding, levelling and arranging the soil in layers.

Operating process of combinators is performed as follows:

a) active operating mechanism(1st poz) looses and grinds the frozen ploughing on the adjusted depth without tilling the layers of processed soil;

b) spiral field ruler(2 rd poz) supplementary grinds the soil, levels and arranges the layers of processed soil.

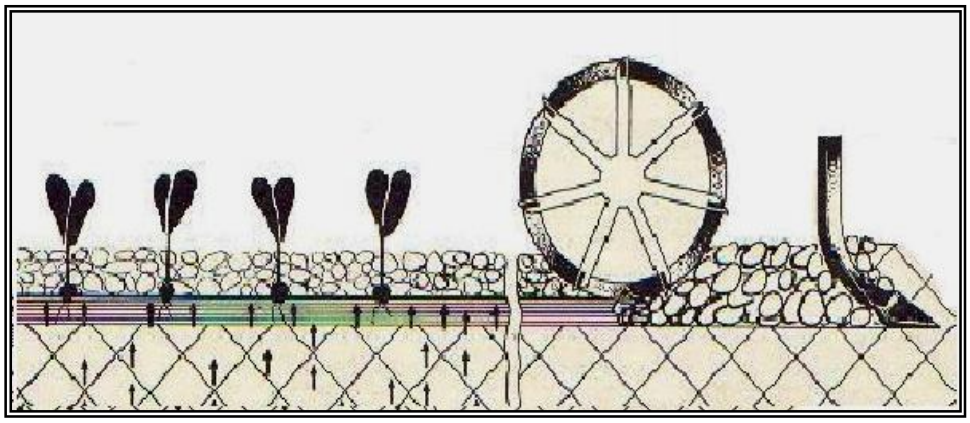

Figure 2. Operating process of combiners

MATERIAL AND METHODS

Disk harrows

The company of **CEAHLĂU Piatra Neamț** produces a large range of disk harrows used to prepare the soil after ploughing. This type of harrows is specialized in clearing the weeds, clods grinding, loosening and levelling the soil.

Figure 3. *Disk harrows produced by the company of a Ceahlău Piatra Neamț*

Table no. 1 shows the main technical characteristics of disk harrows produced by Mecanica Ceahlău Piatra Neamț.

Type	Necessary Tractor , HP	Operating width, m	No of disks, pc.	Weight , kg
GDD 181	45	1,8	22	500
GDP 251	45	2,5	28	650
GDT 251	45	2,5	28	700
GDT 281	45	2,8	32	750
GD 3,2 ME	65	3,2	36	860
GD 3A	120	3	32	1800

MAT Craiova produces light disk harrows GDV2,2 (fig. 4), GDU3,3 (fig. 5) and towed disk harrows SUPERDISK 640 (fig. 6) used to prepare the soil after ploughing, being specialized in clearing the weeds, clods grinding, loosening and levelling the soil.

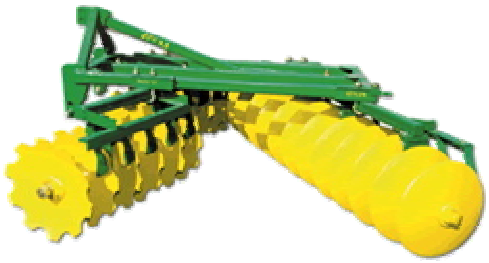

Figure 4 GDV2,2 disk harrow

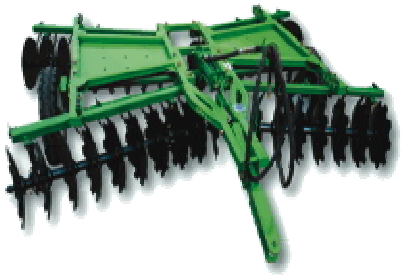

Figure 5. GDU3, 3disk harrow

Figure 6. SUPERDISC 640 disk harrow

Table no. 2 shows the main technical characteristics of disk harrows produced by MAT Craiova.

Table 2

Type	Necessary Tractor , HP	Operating width, m	No of disks, pcs.	Weight , kg
GDV 3,2	45	2,2	24	495
GDU 3,3	65	3,3	36	975
SUPERDISC 640	195	6,4	57	5500

IMUM Medgidia produces disk harrows GDU3,2 (fig. 7) used in disking the tilled soil and in combination with 65 HP working tractor and GD7 disk harrows(fig. 8) used in disking the tilled soil, stubbles and in combination with 180 CP tractor.

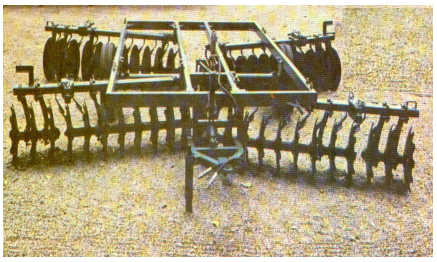

Figure 7. GDU3,2 disk harrow

Figure 8. GD7 disk harrow

Table no. 3 shows the main technical characteristics of disk harrows produced by IMUM Medgidia:

Type	Necessary Tractor , HP	Operating width, m	No of disks, pcs.	Weight , kg
GDU3,2	65	3,2	36	920
GD7	180	7	56	1720

AROMET Buzău produces HFM disk harrows **in X** towed (figure 9) and FLPTF disk harrows in V (figure 10).

Figure 9. HFM disk harrow

Figure 10. FLPTF disk harrow

Table no. 4 shows the main technical characteristics of FLPTF disk harrows in V produced by **AROMET Buzău:**

Table 4

Type	No of disks	Disks diameter	Weight	Necessary Tractor	
	Pcs.	mm	Kg	CP	KW
44 HFM/61	44	610	3160	150-170	110-125
44 HFM/66	44	660	3280	150-170	110-125

Table no. 5 shows the main technical characteristics of HFM disk harrows **in X** towed produced by **AROMET Buzău:**

Table 5

Type	No of disks	Disks diameter	Weight	Necessary Tractor	
	Pcs.	mm	Kg	CP	KW
FLPTF/51	18	510	570	45-55	33-41
22 FLPTF/51	22	510	690	60-70	44-51
24 FLPTF/56	24	560	785	70-80	51-59
32 FPTM/56	32	560	1560	120-140	88-103
32 FPTM/61	32	610	1650	120-140	88-103

This type of harrows are used in stubble ploughing, in preparation of germinative layer for sewing or planting and for entire soil processing(replaces shallow ploughing) in specific agro technical conditions.

The batteries are equipped with front and back smooth disk, and the pressure on disk shall be improved **with** different additional weight set, placed on specially arranged **platform.**

Combiners used to prepare the germinative layer

MECANICA CEAHLĂU Piatra Neamț produces V321 andVM321 combiners (fig. 11) used to prepare the soil for sewing through grinding and breaking up with one crossing .This type of combiners are equipped with disks and chopper elements (conducting springs) for loosen the soil and spiral harrows for level it.

Figure 11. Combiner produced by MECANICA CEAHLĂU

Table no. 6 shows the main technical characteristics of V321 and VM321 combiners:

Table 6

Type	Necessary Tractor , HP	Operating width, m	Operating drilling depth	Weight , kg
V321	65	3,2	1,6…2,6	623
VM32	65	3,2	1,6…2,6	945

AROMET Buzău produces PLAN 500 combiner (fig. 12) carrier with levelling bars double revolving shutter posterior with nicked bars, hydraulic collapsible for transport and BI-PAN semi carrier combiner (figure 13).

Figure 12. PLAN 500 combiner

Figure 13. BI-PLAN combiner

Table no. 6 shows the main technical characteristics of combiners:

There are used various types of combiners produced in Romania to prepare the germinative layer in technical, vegetable **crops** and great cultures as follows:

-combiner for whole cultivation. CCT-6.4 or CPGC-4 type,
-combiner for sugar beet growing CS-2.6 type,
-combiner C-2.6 type,
-combiner C-6.5 type.

Table 6

Type	Necessary Tractor , HP	Operating drilling depth	Operating width, m	Weight , kg
PLAN type				
PLAN 500	105	14	5	2000
PA-V1	165	14	5	2000
BI-PLAN type				
BI-PLAN 400	90	15	4	2350
BI-PLAN 450	110	15	4,5	2650
BI-PLAN 600	130	15	6	3700
BI-PLAN 700	150	15	7	3950
BI-PLAN 800	160	15	8	4200

This type of combiners achieve operating drilling depth 6...18 cm long, and the maximum depth is specific for potatoes growing. These combiners are also used for vegetable growing where the preparation of the germinative layer is made at a ditch depth of 15...18 cm .So, the combiners are equipped with active elements such as big arch and collapsible chisel, placed on holders with a form of inverted „L"

The combiner used to prepare the germinative layer for sugar beet growing, CS-2.6 type, realizes drilling depths of 2-5 cm long. This type of combiners are equipped with active elements having rhomboid section and a point „spoon" type**,** destined to prepare the germinative layer at small depth. Also they are used in vegetable growing in extreme cases to grind the crust and loosen the superior layer, for example in re-soiling of land situation.

The combiner used in potatoes growing **CPC**-2.6 type is the latest model, at maximum 18 cm depth, having similar active elements of the ones from the first model and spiral field ruler from the latest models.

The latest combiners used to prepare the. Germinative layer in technical, vegetable growing and great culture are**:**

- C-2.6, for 45 HP tractor.
- C-6.5, for 100 HP tractor.

CONCLUSIONS

- A proper germinative layer shall have a processed soil arranged in three different layers as follows: an area with light clods at the surface for preserving the evaporation seeds, an area chipped for improving the germination, an area in depth to stimulate the rooting.

- The tillage operation performed by disk harrows leads to great results in grinding, mixing and preparing the soil:

- The combiners are regarded as agricultural machines used to prepare the germinative layer with great results, equipped with operating elements conceived to grind, level and arrange the soil in layers;

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