**Poltava State Agrarian University**

# IMPROVEMENT OF THE TECHNOLOGY OF THE PROCESSING OF FLOWERING CULTURES

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# Purpose and objectives of the study

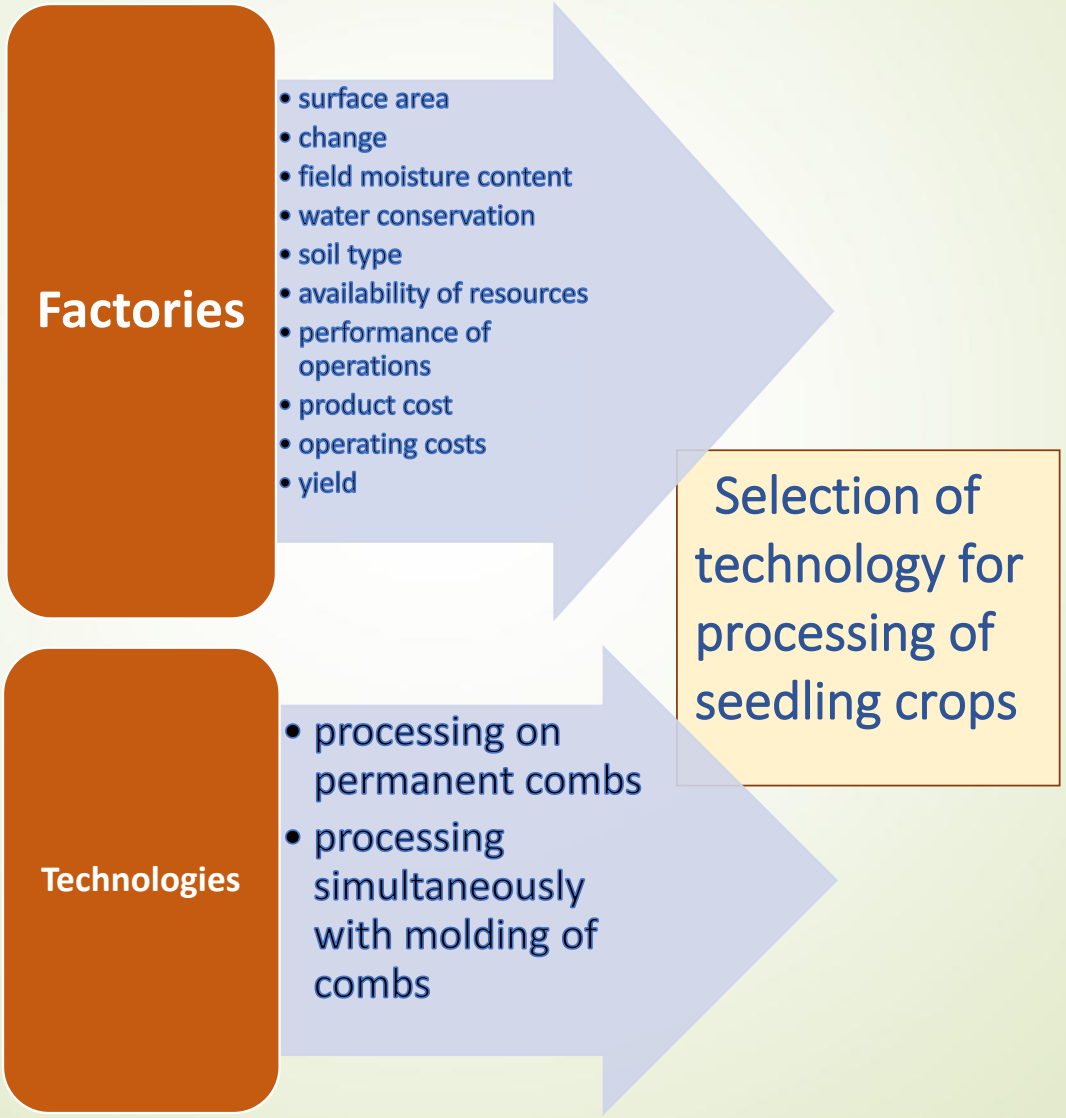
**The purpose of research:**

- The aim of the work is to improve the efficiency of cultivation of row crops by improving comb technology.

**Objectives of research:**

- 1. To analyze the existing technologies and means of mechanization of growing row crops, to identify promising directions for their improvement.
- 2. To give a parametric justification and an energy evaluation of the technologies of growing row crops.

# Factors affecting the choice of row crop cultivation technology



# Means for mechanizing the formation of soil ridges with compacting working bodies

Ridge former with cutter "AUR" and rollers

Cultivator-ridge former Rumptstad RSF 2000

Active ridge former MR

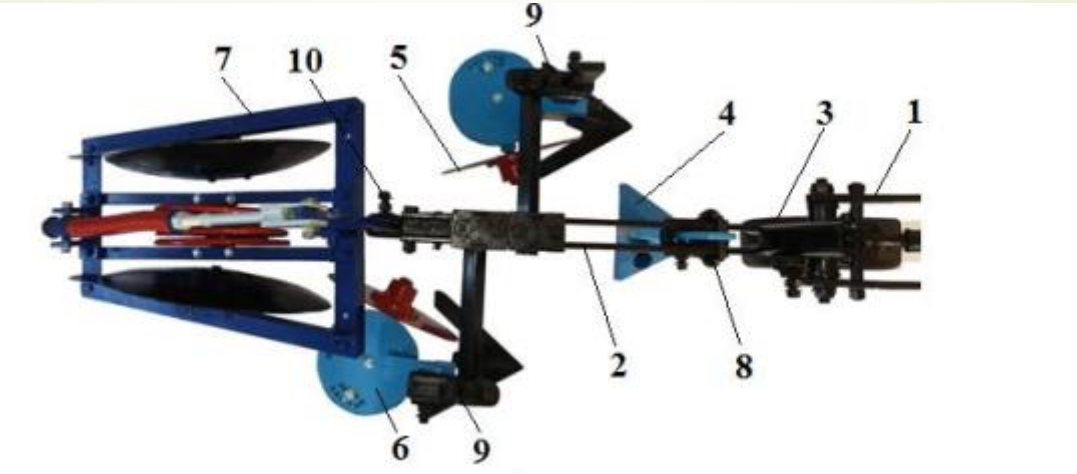
Ridge-forming cutter BASELIER

# Means for mechanizing the formation of ridges by soil displacement with formation turnover

Okuchniki


Disc working bodies

# Selection of means of mechanization of ridge processing




1 - parallelogram mechanism;
2 - shaft; 3 - supporting wheel; 4 – opener paw;
5, 6 - ridge former with right and left flat disks;
7 - comb-forming roller; 8, 9, 10 – holders.

# Operations of classical and proposed technology of cultivation of row crops




stubble peeling


tillage


harrowing


cultivation


crop


harrowing


introduction of herbicides


interline processing


stubble peeling


tillage


harrowing


cultivation crop, formation of ridges, rolling

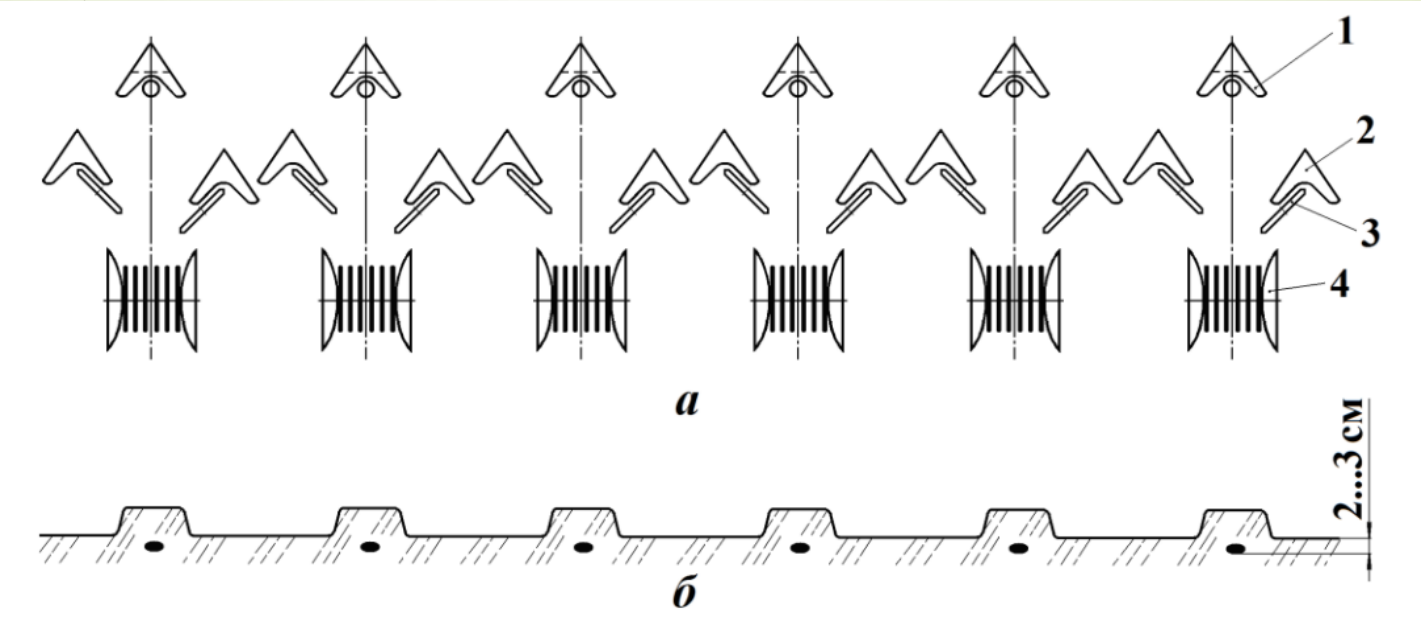
loosening, cutting weeds, hilling

# Energy efficiency of technologies for cultivation of row crops

| herb | energy of finished products, MJ/ha | coefficient of energy efficiency of the technology |
|---|---|---|
| **comb processing technology** | | |
| soy | 21092 | 2,69 |
| corn for grain | 90712 | 12,9 |
| sunflower | 15705 | 2,3 |
| **existing processing technology** | | |
| soy | 17455 | 2,95 |
| corn for grain | 75594 | 15 |
| sunflower | 13087 | 2,7 |

The energy expended in the production of crop products depends on the energy obtained from the combustion of liquid fuel, the energy of workers' labor, the energy of seeds, as well as the energy from the use of fertilizers and chemical plant protection products.

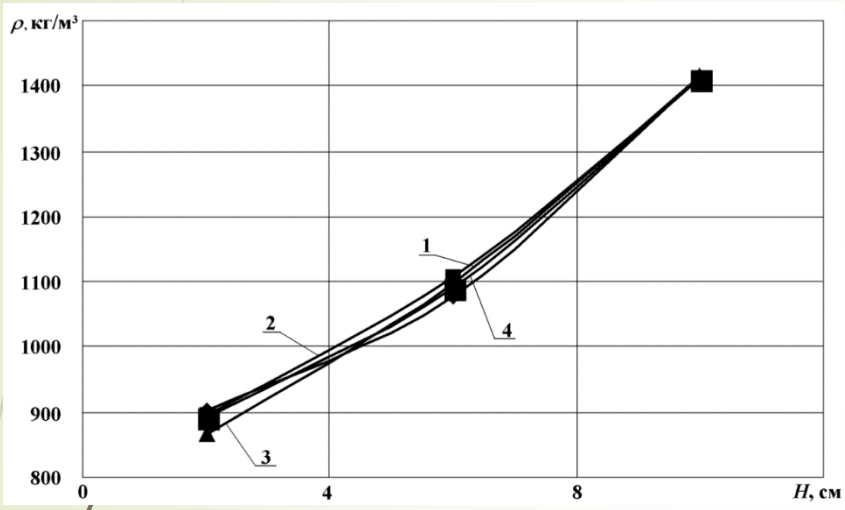
# The method of ridge sowing of row crops

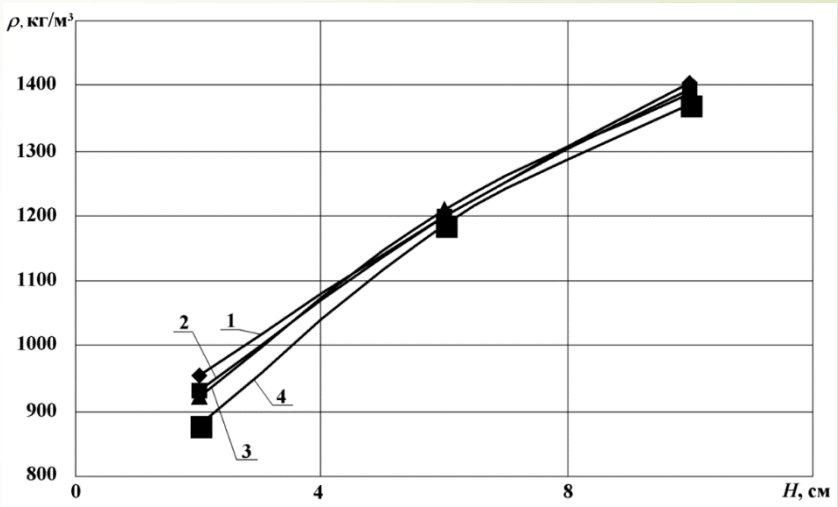



a - diagram of arrangement of working bodies during sowing;
b - scheme of placing seeds in the soil and the shape of the ridge

1 - plowshares; 2 - plowshares with flat disks 3;
4 - ridge-forming rollers

# Dependence of soil density on the height of the ridge on the force of the spring of the ridge-forming roller (1,6м/с)




**angle of attack** $\alpha_{cд} = 0°$

**angle of attack** $\alpha_{cд} = 10°$

1 - $F_{пр}$ = 0 Н; 2 - $F_{пр}$ = 80 Н; 3 - $F_{пр}$ = 160 Н; 4 - $F_{пр}$ = 240 Н

the density of the soil at the top of the ridge decreases with an increase in the compression force of the spring of the roller-ridge-former and increases slightly with an increase in the angle of attack of the spherical disks

# Conclusions

- The proposed model of the technological process with the use of indicators of energy costs for the implementation of the technology made it possible to select technological operations and describe the nature of the processes themselves for their optimization.
- Analysis of the process of soil ridge strengthening by the ridge-making machine allowed to establish that the optimal soil density is 1205 kg/m3 over the suspended seedings of fallow crops, achieved at the angle of attack of the spherical disks of 10°, the spring compression force of 183.5 N and the speed of movement of the ridge seeder of 5...6 km/hour.