

MANAGEMENT OF AGRICULTURAL CULTURE ESTABLISHMENT WORKS

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Abstract

In this article there are presented few of the objectives which are required in the management of the works for agricultural cultures foundation like: the execution of agricultural works with superior qualitative indices; the execution of agricultural works respecting the protection and conservation of soil, respectively the seizure of the carbon in soil; the assurance of vegetative place of plants; the realization of agricultural works in optimal time with minimum costs. Are presented the agricultural used aggregate and the mandatory adjustments imposed by those. It is make a comparative analysis of qualitative indices of agricultural works conducted in conventional system and conservative system and an economic analysis of the costs with the works for of agricultural cultures in these two systems. Are elaborated a series of conclusions and recommendations.

Key words: minimum costs, protection and conservation, qualitative indices

INTRODUCTION

The agro-production process consists of a series of components of the technique with which the cultivator acts on the soil and the plant to form the crop.

These elements are grouped into methods, works, and processes, depending on the soil, the species and the vegetation. They can be of a general character, with mandatory application to all agricultural crops, or a particular character with application for certain crops or applied only to plants.

The modernization in agricultural production aims at expanding and diversifying the mechanization of agricultural works, as it ensures the increase of the labor productivity, the achievement of the good quality works at the optimum terms, which leads to the increase of the harvest and the decrease of the costs over time.

Machines must be as universal as possible, easy to handle, with allow weight, with removable active organs, which allows a reduction in specific investment, metal and fuel consumption.

At the same time, their exploitation will be more economical and efficient, and lower fuel consumption, by categories of works. [8]

1. What you need to know when you start a technology:

1.1. What you want to do, culture, set-up period, vegetation period, phytotechnical conditions, etc.

1.2. What farming system do you want to practice:

Conventional agriculture, intensively mechanized, with competitive products, but based especially on the concentration and specialization of production.

Extensive agriculture with low input: subsistence, with poorly competitive production. Organic or organic farming -

intensive and less aggressive in relation to environmental factors, with less competitive agricultural products in the short term, but which are considered superior in terms of quality. Organic agriculture - the exclusive use of organic fertilizers in relatively high doses. Conservative agriculture consists of applying modern agricultural technologies to increase production.

Precision agriculture: the most advanced form of agriculture, which is practiced on narrower surfaces, based on the most modern methods of controlling the quality of different environmental resources, the optimal application of all technological components.

Sustainable (integrated) agriculture - intensive production of competitive products with harmonious, environmentally friendly relations.

1.3. You choose the technology but keep in mind: the climate, the soil and the money

"Technology is imposed by the climate, the type of soil and the money you have," says Viorel Matei, one of the farmers with experience in agriculture, which exploits over 3,000 hectares in Banat. [7]

"For now, I opt to work interleaved, that is, where scarification is going to happen, in the next year to make a cut. But not in exceptional situations, when the terrain is very difficult; of course, then it is necessary to enter again with the scarifier. [6]

The farmer knows that technologies have changed lately and many farmers prefer not to show up. "I work on two fronts, where the land is beaten come with a scarification work at a depth of 40-60 cm, after which I compulsively cut. Not only does it give the crop plant the opportunity to grow normally but incorporates into the soil and vegetal remains, which are major nitrogen deposit.

Prof. Vasile Popescu, in a specialized publication, points out that after the summer plow the land is very well prepared, the water is stored in the soil until the autumn and there is provided about 100 kg of nitrogen in the soil by incorporating the vegetal remains „in a non-precipitated area, a minimum system of soil works is required.

At the seed incorporation level, a starter dose of nitrogen and phosphorus is added, which

represents 20% of the fertilizer standard administered for each culture set up. [4]

Experience has led to significant savings in terms of costs per hectare, meaning that less fuel is used as well as moderate fertilizer doses, about 200 kg of NPK active substance.

It is advisable that the minimum system of work should be applied only in the spring.

MATERIALS AND METHODS

It is based on studies and researches made by specialists in the field of sustainable agriculture. Sustainable agriculture is a long-term and long-term action aimed at overcoming the problems and constraints of conventional agriculture currently practiced by most farmers.

(i)Tillage systems

The system with no loosening, synonymous with: direct sowing, sowing in the slit, chemical system, mulch system, stubble system, ecological system, no till. [1]

This system is based on the introduction of seed directly into the stalk of the pre-culture without performing any previous soil loosening work, except for the simultaneous sowing of a very narrow strip of sowing only a few centimetres to allow seed to be introduced into the soil. Control of weeds, including weeding plants, is carried out only by chemical methods with the help of biological herbicides if possible. [5]

The system of soil work in strips, synonymous with the work in strips or zonal. This plant cultivation technology allows the loosening and the working or mobilization of the soil in strips or strips with a width of 5 to 20 cm, intended only for sowing, between these bands the soil remaining completely undisturbed, uncorked and covered with vegetal remains so that the surface of the soil after sowing to remain covered over 30%. Compared to the previous work, which referred to direct sowing, by stripping, the soil is disturbed to a greater extent, the degree of coverage of the vegetal remains is lower, but the risk of soil degradation in the long run is higher. [3]



Fig.1. Execution of the soil loosening work in strips
Source: authors.

Vertical lying work consists in loosening and mobilizing the soil on a depth of 20-30 cm, or even deeper, without turning the furrow.

The soil surface remains covered after sowing vegetal remains in a convenient proportion (over 30%). At the same time, soil compaction is shorter in the short term.



Fig.2. Execution of scarifying and rolling work
Source: authors.

The bobbling is a technological plant cultivation that allows for the development of balls or "elevated areas" used as germinating beds where the seed is to be introduced, alternatively with lower areas that can be used as watering pads or areas for the movement of agricultural machinery for other works.

Scarification or deep loosening of the soil

Deep churning, without turning the furrow, is one of the works that influences the condition of crops when climate conditions are not entirely favourable. This is done to break the waterproof layer of the soil and to allow

infiltration of water and air from the upper layers.



Fig.3. Execution of the deep licking work
Source: authors.

The work is done in the summer months, July - August, or autumn after harvesting crops. The minimum depth cannot be less than 40 cm and the maximum depth can be up to 80 - 90 cm, in this case it is a soil drainage that is not recommended to be done annually.

Table 1. The tariffs applied to the farm works for the provision of services with equipment for the year 2014/2015 la SC Agrodez Dandro SRL, Ciocanesti Locality.

No.	Agricultural work	Price with VAT
1.	Plowing	400.00 lei/ha
2.	Scarificator	400.00 lei/ha
3.	Milling	250.00 lei/ha
4.	Disk	190.00 lei/ha
5.	Sowing	140.00 lei/ha
6.	Hoeing	140.00 lei/ha
7.	Fertilize	50.00 lei/ha
8.	Sprayers	50.00 lei/ha
9.	Harvesting	260.00 lei/ha
10.	Grain transport	30.00 lei/km
11.	Cleaning	190.00 lei/ha
12.	Baleing	3.00 lei/buc

Source: SC Agrodez Dandro SRL, Ciocanesti Locality.

(ii)Cut costs by optimizing engine speed

The method is based on analysis of the traction diagram of the aggregate used for the execution of agricultural works, for both soil cultivation systems.

Plowing is the agricultural work that consumes about 30% of the amount of diesel allocated to all mechanized agricultural work as a result of high specific consumption, which has negative economic repercussions. Running the right way can reduce fuel consumption.

Table 2. Expenses with the application of conventional soil technology

Work	The aggregate used	Expenditures (lei/ha)	Fuel consumption (l/ha)
Plowing	Tractor+ plug	400.0	18-28
Disk	Tractor+ Gr. discuri	190.0	9-14
Cultivation	Tractor+ cultivator+tăvălug	140.0	9-14
Sowed with fertilized	Tractor + seed drills +fertilizer equipment	140.0	9-14
Fertilizer Management	Tractor + chemical fertilizer spreader	50.0	5-7
Weed control	Tractor + sprayed machine or equipment	50.0	5-7
Combating diseases and pests	Tractor + the machine or equipment sprayed and dusty	50.0	5-7
Harvesting	Combine	260.0	12-16
Transport	Tractor + trailers	30 (lei/km)	5.7 (l/h)
Seeding Material	Certified seeds		
Fertilizers	N,P,K		
Chemical preparations	Chemical substances to combat diseases and pests		

Source: SC Agrodez Dandro SRL, Ciocanesti Locality.

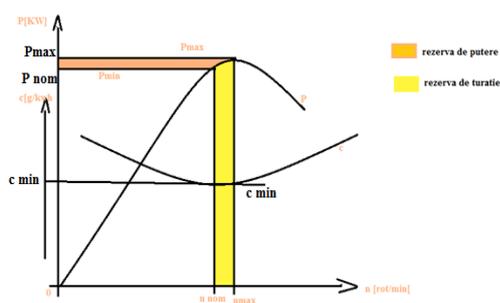


Fig. 4. External feature of the thermal engine

Source: authors.

RESULTS AND DISCUSSIONS

Air and water are the factors that, along with the nutrients obtained from biochemical processes in the soil, conditioned by these factors, provide the favorable environment for plant growth and development.

Table 4. Porosity and apparent density of soil according to the work performed

Agricultural work	Porosity (%)		Apparent density (g/cm ³)
	Aeration	Total	
Plowing at 28cm	24.3	35.7	0.91
Loosening	26.0	34	0.87
Deep hatch	28.7	31.3	0.81
Vertical milling	31.1	28.9	0.78

Source: <http://www.fao.org/nr/land/sustainable-land-management/en/>

Generally, a middle soil consists of 50% solids and 50% open spaces, occupying 25% with air and 25% with water.

Depending on the type of soil and how it is worked, the volume of the soil can vary very much. So, when talking about soil porosity, we have in mind these spaces that keep the volume of water and air in the soil steady.

CONCLUSIONS

Total soil porosity can be 48-60%, of which capillary porosity 30-36% and non-capillary porosity (aeration) 18-24%.

Aeration porosity is considered deficient when it is 6-10%, moderate 11-22% and good when it represents 23-30% of the soil compartments.

It is practically considered a favorable situation for crop plants when the soil pores are occupied 2/3 with water and 1/3 with air.

The root system develops well at 1.07-1.45 g / cm³ Da and the soil nitrification process at Da of 1.11-1.15 g / cm³.

Radical changes in soil porosity occur after plowing. Thus, prior to cutting, the capillary porosity was 26.1%, and the pore size was 12.3%, while the non-capillary porosity was 11.2, and after 42.5% the pore.

Of course, both through the natural settlement of the soil and the subsequent works, the porosity values return to normal.

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