NOILE TEHNOLOGII DE FERTILIZARE CU ÎNGRAŞĂMINTE ORGANICE SOLIDE, APLICABILE ÎN ROMÂNIA

NEW MANURE SPREADING TECHNOLOGIES IN ROMANIA

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Abstract: *In this paper are presented the manure spreading technologies, enabled in Romania, on the plane soil.*

Rezumat: *In aceasta lucrare sunt prezentate tehnologiile de fertilizare cu îngrasaminte organice solide, aplicabile în România, pe teren şes*

Key words**:** *manure spreading technologies*
Cuvinte cheie: *tehnologii de fertilizare cu ingrasaminte organice*

INTRODUCTION

Taking into account the general orientation at worldwide level, to use ecological products, in Romania have been developed some manure spreading technologies, which will be presented in this paper. The manure spreaders will prepare ecological soil fertilization, aiming to improve its fertility, aiming to obtain natural products, without chemical compounds, through an improved quality and integrity of the food and beverage chain, thus having a favourable impact on the maintenance of the user's health condition. The benefits of the environmental-friendly agriculture are: the ecological products are harmless for human being, they contribute to a longer vegetation life.

AGROTECHNICAL REQUIREMENTS

The main requirements that must be respected in manure spreading technologies as well as those that must be fulfilled by the technical equipments inside those technologies are:

- The manure conveys must be done in small heaps on the field. It is not recommended to spread and incorporate the manure after a longer period of time, because the loses can reach to 30...40% after only 3 days and, furthermore, it is developed an irregular fertilization;
- The farmyard manure must be as less as possible in contact with the air, in order to favourable for the anaerobic fermenting process. The platform must be as compact as possible and must provide juice collection; also, chopped straw must be inserted in the manure composition, to ensure easier manipulation. The manure platforms must be placed so that it could easily allow the access of charging and conveying equipments;
- The efficiency of manure fertilization depends of the method and period of application. The application under the furrow leads to a bigger efficiency comparing to the embedment under the disk;
- For a bigger manure efficacy, it has to be taken into account the type of soil and the depth at which the manure is applied. The manure must be deeper incorporated in the light soils and in the arid areas, comparing to the heavier soils or in the humid areas. Also, less fermented manure must be incorporated deeper than the fermented one, in order to avoid nitrogen losses and to a better incorporation of the vegetal residues;
- The spreading uniformity has an important role in obtaining an optimal response at plant harvesting. The spreading uniformity is important, because organic nutrients that must be

applied require that the spreaders supply nutrients on the whole spreading width and for this reason the spreaders must not leave uncoated soil areas or multiple time coated areas;.

➢ Manure fertilization must be done once in every 3...4 years, considering its residual effect, with doses management of 20…30 t/hour, depending on the requirements of the culture to be seeded;

For the manure administration effect to increase the culture production, it is necessary that the aggregates which perform the work fulfils the next agrotechnical requirements:

- to comply with the standards with 3...5% plus or minus deviations;
- manure spreading uniformity on the whole coated surface must be at least 80% (including the overlapping areas between two adjacent pathways);
- the wheels entering the componence of rolling train of the manure spreading machines must be equipped with high inflation and low pressure tyres, in order to avoid excessive soil compaction;
- farmyard manure spreader machine's grab must be splay, in order to block the material on the back side of the machine;
- the spreading equipment must have the barrels arranged in a plane forming an 10...15 degrees angle from the vertical, known as the slope angle of the manure, in order to allow the material's drive with reduced effort;
- the machines must be designed so that the flow of spreaded material can be correlated with the machine's, to realize the distribution uniformity.

APPLICATION CONDITIONS OF THE MANURE SPREADING TECHNOLOGIES

Manure administration must be done only through specialized work groups, which are fitted with the next equipments:

- an chain tractor with pusher blade for waste storage yard arrangement, in order to create an adequate working front for grab bucket loader or frontal loader;
- frontal loaders or grab bucket loaders for manure loading in hauling ropes;
- dump wagons for farmyard manure conveying in the field; transfer ramp for the material from the dump wagons into the spreading machines.

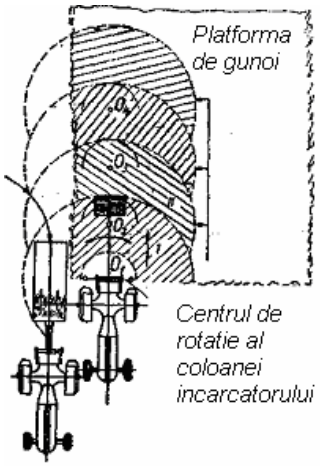


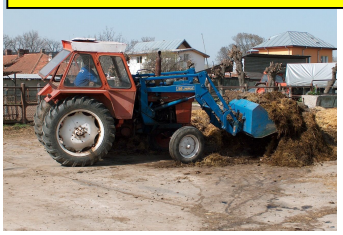
Fig.1. Scheme of waste storage yard

Fig.2. Operating mode of the grab bucket loader arrangement

MANURE SPREADING TECHNOLOGIES PROCESSES

STORAGE YARDS ARRANGEMENT
(chain tractor with pusher blade)

MANURE LOADING IN CONVEYING VEHICLES
(frontal or grab bucket loaders)



MANURE LOADING IN FERTILIZATION AGGREGATES
(manure spreaders)

CONVEYING TO THE DISTRIBUTION PLACE
(general use dump wagons)

FERTILIZATION
(manure spreaders)

MANURE TRASFER IN SPREADING AGGREGATES
(frontal or grab bucket loaders)

NEW MACHINES WITHIN THE SPREADING TECHNOLOGY

Manure spreading technology has been completed by the achievement of a consortium formed by: INMA Bucharest, INOE 2000-IHP Bucharest, INCDMF Bucharest, Politechnical University of Bucharest and "TRANSILVANIA" University of Brasov, based on the CEEX-AGRAL, nr.19/2005 contract, signed with USAMV Bucharest, for a machine with useful mass of 5 tones, MG-5.

The MG-5 machine is designed for manure conveying and spreading, on fields with maximal slope of 6^{o}. This is the first Romanian concept machine, equipped with spreading dispositive with vertical barrels, having two variants for conveyer drive, hydrostatical or mechanical.

Technical and functional characteristics

Tractor from the aggregate, CP ..... min. 65
Useful mass, t 5
Net mass, kg.....2390
Conveyer ..... with paddles disposed on chain
Conveyer drive ..... mechanical / hydrostatical
Spreading device .....with vertical barrels
Effective spreading width, m cca.8
Work capacity, ha/h ..... 1,95...2,53
Spreading device drive .....from the tractor's APP
Rolling train .....uniaxial
Wheel track, mm 1600
Work brake..... pneumatically, with one pipe
Stationary brake..... mechanical, on the wheels of the fore axle-tree
Rate of travel, km/h
- in work 7
- in transport 15

CONCLUSIONS

The manure spreading machine was tested under laboratory conditions as well as in working conditions, the results of the experiments pursuing to be presented in another article. The results obtained during the experiments confirmed the expectations, rising at the level of the machines realized on the external plan.

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