EUROPEAN DRIFT IN THE WASTE MANAGEMENT FOR ENVIRONMENTAL PROTECTION PURPOSE ABSTRACT

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Abstract. As a result of the big quantities of waste, which result daily from the farms, the pollution and the protection of the environment are considered as one of the main problems confronted by the Romanian society. Performant systems for collection, evacuation, deposit, transport and management of the waste used as fertilizing for agricultural land, which can function according with the projections parameters, can be considered important facts in farm management. The use of the performant systems of evacuations, transport, deposit and spread of the waste, can assure together a good production and the environment protection, this emphasizing the importance of the correct use of modern systems of waste management.

The quality, evacuation and deposit of the waste is a integrated part of the farm management. Maintaining an optimum climate, with good effects on the animal producing and health, can be obtained only if the waste is rhythmical and properly managed, being used as a utility. Beyond the shelters waste disposal, the protection of the environment is the main purpose, together with obtaining and using the manure for agricultural purpose, reduction of the time and cost of transportation of the waste.

In this presentation, will insist mainly on the collection of the waste in channels covered with grills, using the hydraulic system which is less known in our country. In this way there are few technical solution:

1. Hydraulic evacuation by pumping the waste, in this case the waste is situated under the grill floor, the channels being projected for a known volume of waste. The volume of the channels is correlated with the capacity of the pumping and homogenizing machines which evacuate the waste trough the evacuation holes situated outside of the shelter. The great deposit volume situated under the grill floor, is eliminating the need for construction of a buffer hole, near the shelter, but there are some disadvantages like:
   - the assurance of ventilation on the whole time of waste homogenizing period, time when the animals have to be evacuated outside of the shelter into paddocks. When the management is poor, the level of toxic gases can rich such a level when the the animals or the personnel can die.
   - when the channels are emptied up, under the grill floor some thermal currents will be created, a relative chilly space, which have a negative impact on the interior of the shelter
2. Hydraulic evacuation of the waste with floodgate is a known solution in our country, for evacuation being used channels and pipes. The channels can be 3.0 m in length and can be adopted to all type of shelters.

In the EU countries, with an advanced agriculture, because of the used of heavy and broad floodgates the waste is emptied into a system of channels with corks. Instead of a heavy, hard to manage floodgate, a number of small corks can be installed, which are easy to lift. The length of the channel cannot measure more than 30 m, that’s way the shortening of the channels by transversing compartments is recommended. Before the first use, the channels have to be filled with water or urine, for avoiding the stick of the waste on the channels floor.

The system has demonstrated its functionality mainly in the shelters used for pigs exploitation. By lifting the corks, the waste is diverted in a pipe with 200-250 mm in diameter, which is assembled under the channel. The corks have to be lifted after 6-7 days, when the waste is being evacuated to the accumulation ponds. The research made in other countries recommends to fit the emptying holes at 2-4 m.

As a result of the experiences made so far, there are contradictions regarding the transversing disposition of the emptying holes. Contrasting with the piglets paddocks, was found that the shelters for fattening pigs, can not be completely cleaned, the waste sediment on the bottom of the channels being evident.

3. Hydraulic evacuation by channels with floodgates is offering the possibility of evacuation of the waste from the channels by a slow and continuous flow on a liquid pillow. The channels have the bottom perfectly horizontal, and from 10-12 m intervals, they have to be lowered with 20-25 cm, forming doorsteps which are higher then the anterior channel with a nose of 8-15 cm, and an inclination of 45 degrees in the flowing direction. The nose have the Superior part protected by a metallic profile, which have the shape of a blade, for a lengthy exploitation period. The height of the channels is calculated following the length of the area (table 1)

<table>
<thead>
<tr>
<th>Channel minimum height (cm)</th>
<th>Channels length (m)</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>15</td>
</tr>
<tr>
<td>Cattle adults, young</td>
<td>75</td>
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<tr>
<td>Milking groups</td>
<td>75</td>
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The width of the channels is 60-90-120 m, for the dairy cow’s tide accommodation system and 2.0-2.5 m for the dairy cow’s free accommodation.

The longitudinal channels are evacuating the waste in a traversal channel with a doorstep and a nose too, who is leading in the buffer hole. The solution is functioning without adding any supplementary water, if the shelters are permanently populated at the capacity for which they have been projected.
4. The research has proved the fact that the waste fluid is flowing easily by channels and pipes and can be evacuated by waterspouts.

The waterspouts channels have a semicircular shape, with 250-300 mm in diameter and a ramp of 1% on its entire length. A transverse channel collects the fluid waste and transport it to a closing flap (cork) situated over an evacuation pipe which have a ramp of 1-1.5%.

The square channel, have no ramp on a longitudinal plan. The research shows that a transverse ramp of 3% does not cause any problem. At the beginning of the evacuation process, a quantity of the fluid waste is evacuated by the longitudinal channel, and the other part will be transported to the transverse channel, to the evacuation hole. In the waterspout a ramp is being developed, who allow the evacuation of the waste material.

The method of the collector waterspouts is utilized for the evacuation of the waste in the shelter of the pigs, where the length of the channel must not exceed 13-18m at a 1% ramp.

The width of the channels it is correlated with the dimension of the grills which usually does not exceed 3.0 m. The minimum depth is 30 cm (for 13 m in length). At this depth the fluid waste must be eliminated twice on a fattening period. When the waste is not evacuated through the whole process of fattening, it is necessary a channel with more than 60 cm in depth. The concrete channels have to be plastered with mortar and water proof concrete.

5. The evacuation system of the waste by recirculation they took place because of some irregularities in the process of the evacuation of the collecting holes.

One of the channels situated under the grill floor is being traversal closed by concrete walls, which permit to fit on the bottom of the channel, a shaking installation with a propeller. The fluid waste will move slowly in the whole channel system, when the entire content will be homogenized. The mixing installation is moving the whole quantity of waste in the channels lifting the level of fluid waste, the floating layer being moved, dragging the content of the whole system [2].

It is recommended to build on the surface of a shelter 2-4 longitudinal channel. A transverse channel, which is joining them have the width equal with the most narrow channel. If the empty process is not rhythmic and the channels are to full, during the homogenization process the mixture will fling on the floor, which will lead to a slowing in the flow process.

6. The forced recirculation with pumps it is another procedure of evacuation of the waste, similar with the recirculation one, which is eliminating the waste daily, and the channels are being washed up with ventilated manure [3].

In all the possibilities presented above, the channels are being constructed by using reinforced concrete shaped in blocks, isolated for ecological purpose. The internal surfaces are finished for a lack of friction.

On a transverse section the channels have a rectangular shape. It was found that by splaying the bottom of the surface by 10 cm compared with the top, will lead to a better evacuation of the waste.

Regularly, the waste cannot attack a quality concrete. The concrete has to have an appropriate quality, being at least class B25, with a normal consistence. The additives have to respect the STAS norms.
The walls of the channels need to be at least 15 cm thick, if they sustain only one underpin of the grills. Or 20 cm thick if the floor is underpinning both parts of the grill. The concrete cover of the reinforcement must be 3.5 cm.

It is important to use a watertight concrete. After shaping and hardening the concrete it is necessary to treat it for becoming waterproof.

Because of the great quantities of waste which have to be manipulated daily in farms, the pollution and the protection of the environment are being considered the most important problems found within Romanian society.

Performance systems for collection, evacuation, deposit, transport and management of the waste as manure for agriculture, with a good functioning, can be considered as being important in a farm.

By using performance systems for the evacuation, transport, deposit and spreading of the waste, we have the guarantee both good productions and the protection of the environment, which is important for the last few years, reason for using and utilizing correctly modern systems.

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