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Machinery trends in organic manure spreading

Presented here are important technical trends in the spreading of organic manure as reflected in the machinery and equipment program at Agritechnica 2001. The preview cannot take the place of a visit to the event and instead only offers preliminary information and does not claim to be comprehensive.

Technology for transport and spreading of liquid and solid dung has improved greatly in the past years offering advantages especially in improved exploitation of manure value and reduction of environment pollution risk. Recently, labour and economic aspects in the further development of such technology increased in importance because the application of this organic dung increasingly takes place over several farms.

Advances in solid dung systems

Solid dung systems are of especial importance for poultry, calf rearing and pig rearing systems. Appropriate storage capacity – usually concrete plates – is required so that dung can be spread at the right time. Usually, there is no treatment in the sense of mixing. This currently represents a very demanding operation because no special machinery is available. The most one can do under the description processing, i.e. mixing, is a one-time turning of the midden.

Spreaders of increasing capacities are applied for bringing out the solid manure with subsequent high demands on their running gear. Following the establishment of large-volume, low-pressure tyres developments are now encompassing linked tandem and triple axles for keeping ground pressure to a justifiable level. Tyre pressure regulating systems are being increasingly offered with the very large spreaders.

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Keywords

Trends of development, solid manure spreaders, slurry processing and application

In the past, precise application of solid dung, with its very variable specific weight depending on degree of rot and moisture content, presented a difficult problem. Through trailer-integrated weighing systems and chain and slat flooring controllable according to tractor forward speed notable advances have also been made in spreading precision. In fact, spatially-specific spreading is possible when metering systems are linked to GPS technology. The actual spreading of manure takes place mainly with broadcasting equipment including spreading plates.

Liquid manure technology: a higher level of development

Liquid manure or slurry can nowadays be spread much more precisely. Mixing is necessary before transport to the field because solid and liquid components of slurry separate during storage. Propeller mixers have become established for homogenisation because of their good working efficiency. Electrical immersible mixers are especially suitable for single farm application and tractor-driven shaft mixers for use between several farms.

Slurry pumps, used more for forwarding the material rather than mixing it, feature a series of improvements with rotary pumps producing higher pressure and dis-

placement pumps now quieter, wearing less readily and easier to repair.

Handling systems over and above mixing have been unable to establish themselves in practice. Usually, these are not required for better plant nutrition and more environment suitability of slurry. Biogas plants which exploit the energy in slurry have achieved substantial importance. Economically, these can be interesting where a high price is achievable for the electricity, the heat produced can be used year-round and when additional income can be realised from taking delivery of externally-produced organic material for the plant.

The tankers used for spreading slurry have increasingly high capacities aiming at cost reductions through higher unit spreading capacity. This, however, is only possible when the machinery is exploited sufficiently. Higher performances for compressor tankers are possible through the so-called filling expediter enabling not only a faster, but also a more complete, filling of the tanker and also chopping-up larger slurry components. Additionally, some models can mix tanker contents.

Application precision is important especially with slurry tankers that are used over several farms. The tendency here runs to electronic systems which show the actual amount applied or control slurry flow in relation to tractor speed according to pre-programmed exact application amounts per hectare.

Many arable farms employ, to a large extent, trailing hose distributors for spreading. These have established themselves very well in this sector because of their exact distribution. Injection systems are also increasingly used. For slurry spreading on pasture, the trailing shoe distributor has not been able to establish itself as expected. Higher costs and the limited working widths are important reasons for this. Slurry broadcasters are important on smaller farms that spread on fields without growing crop with immediate incorporation by cultivator. Impact head and pivot jet systems currently achieve the best possible spreading precision from all the many different available systems.



Spreading unit Bergmann TSW 1616S twin plate broadcast aggregate mounted on a truck with low ground pressure tyres