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HEADLINE

Large drops, low losses

ABSTRACT

Swiveling spreaders fulfill all requirements for environmentally sound manure application

MAIN TEXT

Manure should be applied simply, cheaply, precisely and with as low a loss of nitrogen as possible. Wide spreaders like deflector heads and deflector plates may be cheap, but they are not recommended because of the high nitrogen losses. Drag hose spreaders keep the nitrogen losses very low through ground-level application, but they jam more easily (depending on the manure composition) and the manure remnants ("sausages") often end up in the feed in pasturelands. And how about swiveling spreaders? The Manure Co-operative in Erkheim now offers farmers application using a Möscha swiveling spreader as an alternative way of applying manure. We already did a report on this association, which refers to itself as Öko-Güll 2000 GbR, in the Wochenblatt issue 1 of 1/6/2006. Most recently, the Möscha swiveling spreader was simply mounted onto a manure tanker with a drag hose spreader. The farmer can decide for himself which spreading technique he considers to make sense on his land. Just when the pastureland is already being "jump-started", coarse-dropped application with the swiveling spreader brings many advantages, as is unanimously expressed by Gregor Holzheu, Alfred Aldinger and Karl Karrer of the Manure Co-operative.

Minimizing nitrogen losses

This is because manure cannot be incorporated in pastureland and is subjected in part to longer "evaporation". With the Möscha swiveling spreader, the manure ends up on the ground in coarse drops and at a low speed. The drops are little deformed as a result. The plants are not pressed down and do not get as dirty. The reduced contamination of the leaves significantly diminishes the loss of nitrogen (no direct exposure of the manure to the air) and results in fewer burns (better plant growth). The manure is better protected by this coarse-dropped spreading and can still quickly be flushed into the ground during subsequent precipitation. But the Möscha swiveling spreader has proven itself in arable farming as well, as pig farmer Martin Welt from Lippach near Aalen reports. Two swiveling spreaders were mounted to his manure tanker, enabling the vehicle to achieve a working width of 21 meters. As a result, he can use the existing driving lanes when manure is applied in the spring as a base nitrogen dosage to rapeseed. The Möscha swiveling spreader consistently did very well for both cattle and pig manure in a DLG comparison of manure spreaders (deflector head, deflector plate and swiveling spreader): Whether it be spreading accuracy, working width or impact speed and droplet spectrum. Even the surface wetting after application is lower compared to the deflector head and deflector plate. And finally, the Möscha swiveling spreader proved to have very good to good operational reliability in the wind up to wind force 3. "To reduce the nitrogen losses during and after application, it is essential to conservatively distribute the manure, that is, to slow the rate of evaporation with the application technique. The most well-known and effective technique for this is to apply manure with drag hoses. The surface of the manure is greatly reduced and the evaporation process is slowed down. What is even less known is that this effect is also achieved with the Möscha swiveling spreader," explains Helmut Mößner, manufacturer of the Möscha swiveling spreader: "The goal of all manure spreading is to slow down evaporation. Because of the geometric form of the swiveling head and because of the deflection of almost the entire manure stream, the Möscha swiveling spreader is capable of forming large drops. The bigger the drops, the better the manure is protected from evaporation. Due to the reduced surface and a higher weight to the surface, the spreading is also better in crosswinds. This was also measured and documented in the DLG test. For this reason, the Möscha swiveling spreader causes far less nitrogen loss than a deflector head spreader." This also greatly depends on the speed of impact of the droplets.

The higher the distance to the ground and the speed at impact are, the larger the wetted area is. Upon impact, the drops break up into smaller drops. "This fact is very important when the Möscha swiveling spreader is compared with other spreaders, especially with the deflector head spreader (also called high or gooseneck distributor). With the Möscha swiveling spreader, the large drops are released at a reduced speed and slowed down on the slight upward trajectory," explains Helmut Mößmer of the operation of his swiveling spreader. The discharge velocity at the nozzle of the deflector head is 11.6 m/sec, which corresponds to 42 km/h. The exit velocity from the swiveling head is only 8 m/sec, which corresponds to 29 km/h. The Möscha swiveling spreader is intended for vacuum, pump and centrifugal tankers. The working width is adjustable: at 0.5 bar up to 12 meters, at 1.0 bar up to 15 meters and with type W up to 18 meters. Manure fertilization in higher plant populations is also possible here. Helmut Mößmer offers farmers a free test period. It is not without pride that he refers to the DLG test: most accurate spreading with very good marks. Möscha employs 10 workers (on a €400 basis), mainly welders, and produces over 1000 swiveling distributors per year. Wife Marianne Mößmer is responsible for shipping and for the office. Helmut Mößmer has metalworking experience and until 1992 had a bovine feedlot, and, therefore, he has expertise in both the agricultural and metalworking fields. Helmut Mößmer also told us how the company's name, "Möscha", came about. It is a combination of the family name Mößmer and the place name Schalkshofen.

New Fertilizer Ordinance

Finally, Mößmer also referred to the numerous inquiries and uncertainties of farmers regarding the new fertilizer ordinance. He asked manure specialist Dr. Hans-Heinrich Kowalewsky of the Chamber of Agriculture of Lower Saxony: "At various points of the new fertilizer ordinance, direct or indirect demands on technology are listed. However, these requirements are not always formulated clearly and not always comprehensible without background knowledge. Up to now, the equipment used for fertilization has also had to comply with the Generally Accepted Rules of Engineering. This has become more precise. According to annex 1 of the new fertilizer ordinance, the following devices no longer comply with the "generally accepted rules of engineering":

- Liquid manure tankers with an open discharge to the spreader.
- Central deflector spreader, which has an upward stream. But swiveling nozzles and even deflector spreaders that emit downwards (commonly referred to as deflector heads) conform to the Rules of Engineering.
- Manure tankers with a vertically arranged centrifugal disk for the application of undiluted manure.
- Rotary jet sprinkler for undiluted manure.

Using the aforementioned spreaders, which are no longer state-of-the-art, is not immediately prohibited, but rather only:

- as of January 1, 2010 if these units were commissioned after the 14th of January, 2006;
- as of December 31, 2015 if these units were commissioned by the 14th of January, 2006.

Of the spreaders that are no longer state-of-the-art, only the central deflector spreaders with upward directed emission are of greater significance. These spreaders can be replaced by relatively inexpensive swiveling spreaders or downward emitting deflector heads.

PICTURES

1. Karl Karrer and Alfred Aldinger (right), board members of the Öko-Güll 2000 GbR in Erkheim.
2. The large drops are easy to distinguish in the picture during the application of manure with the Möscha spreader on the farm of Alfred Aldinger.
3. A working width of 21 m is possible with the two swiveling spreaders on the manure tanker. The driving lanes are fully usable. The pig farmer Martin Weik (right) in Lippach near Aalen applies the manure of his 600 breeding sows using this technique.
4. Helmut Mößmer tests and demonstrates the lateral spreading (average deviation from the mean value of 4.8 percent) of his swiveling spreader with 1 x 1 meter drip pans on the farm. His wife Marianne is responsible for shipping and for the office.