Applying Manure to Living Crops

Developing methods to apply manure effectively and efficiently into living crops could accomplish significant environmental and agronomic benefits for farmers.

Living crops take up manure nutrients quickly, reducing potential for losses to air and water. Application into living crops decreases odour from manure and can free up space in a manure storage. Workload balance and ideal soil conditions to prevent compaction are other reasons for applying manure to living crops.

Ontario Pork, pork producer, Jake Kraayenbrink, and researchers from OMAFRA are working on a new European-style disk injector. The use of this equipment is an alternative to standard manure injection techniques.

This liquid manure applicator, which utilizes a shallow injection disk with 7.5- inch spacing, will be customized to suit Ontario's soil structure and economic climate, and will be tested for functionality and evaluated agronomically on 2012 crops of wheat and corn.

European-style disk injector pulled by a tanker with crab steering to avoid compaction

Did You Know?

Timing of manure application and use of practices such as injection or incorporation of manure conserves up to 40 per cent of the nitrogen and reduces odour complaints.

Farmers who practice good environmental stewardship benefit themselves, and their communities.

Open communication and cooperation with neighbors develops good relationships, decreasing complaints and promoting acceptance of livestock production.

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Responsible Manure Practices

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Environmentally-Friendly Manure Applications

Livestock producers care about their land and animals and work to farm in a sustainable manner.

An effective shelterbelt

Taking proactive environmental measures can improve a farm's bottom line. For example, planting a windbreak can control offsite odours, and enhance the look of a farmstead and at the same time can save money on heat and ventilation. Incorporating or injecting manure will not only improve neighbour relations but will also conserve up to 40 per cent of nitrogen. Maintaining good environmental practices can also have a beneficial effect on how neighbours view hog farming.

A Farm & Food Care Ontario Canadian Food and Farm Issues Study by Ipsos Reid, found that more than half of Canadians surveyed have a positive impression of agriculture in this country, a figure that has risen 16 per cent since the survey was first conducted four years ago. Although nearly all provinces showed an increase in the overall positive impression of Canadian agriculture, the strongest gains were found in Ontario. Positive perceptions in this province jumped 10 per cent from 56 per cent in 2009 to 65 per cent in 2010.

Manure Application

Injecting manure into corn

Most livestock farmers use manure to fertilize crops. It is important to apply manure properly to avoid its leaching into ground and surface water and to control its potential odour. More and more farmers are incorporating and or injecting manure into the soil. This practice reduces odours substantially, while conserving over 40 per cent of the ammonia that can be volatilized into the air if manure sits on the surface. Proper incorporation also reduces the amount of manure that could leach into ground water or erode into surface water. If manure is mixed well with soil particles, it clings to them and allows bacteria to break it down, so that plants can use it. It also feeds the beneficial bacteria in the soil so they can multiply and therefore overpower potentially harmful pathogenic bacteria.

Manure injection must be done properly at the right time with the right tools or it can cause as much leaching as surface spreading without pretilling. Agriculture and Agri-Food Canada research has shown that if manure is mixed well with soil using wide vibrating sweeps, manure remains in the soil and is available to plants. By applying the proper quantity of manure and using the proper equipment at reasonable soil moisture contents, manure application via injection does not result in significant transfer of manure constituents to drainage tiles.

Zonejection: A New Conservation Till Manure Delivery System

Research scientists from Agriculture and Agri-Food Canada have been perfecting a new method of manure application. Many farmers are using no-till techniques and are reluctant to work the soil prior to or after manure application. Zone-tillage offers a compromise between no-till and other reduced tillage systems by tilling only a small area around the seed to preserve soil structure, while leaving residues from previous crops on the surface to protect soils from erosion.

A zone tillage tool bar was mounted to a manure applicator and accomplished the two activities in one pass calling it zonejection.

Zonejection could provide a double benefit to the grower. Reducing tillage operations and adding nutrients to the soil at the same time, attains both the benefits of tillage on crop production and of conservation tillage. This can minimize possible negative environmental impacts of manure application.

It was found that the time of year manure was applied affected grain yield. With zonejection in the fall, nitrogen availability and crop yield response was variable. After a rainy, mild winter, less nitrogen remained from fall-applied manure than after a cold winter and corn yields were reduced, despite compensational application of side dress nitrogen fertilizer.

Results showed that when swine manure was zonejected during the crop year (preplant) and no additional nitrogen fertilizer was added, grain yields were comparable to corn grown under conventional till with inorganic fertilizer.