AQUA

Achieving good water quality status in intensive animal production areas

VENETO AGRICOLTURA
Azienda Regionale per i settori Agricolo, Forestale e Agro-Alimentare

Convegno finale - Il controllo dell'azoto nelle aziende agro-zootecniche

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ACTION 2 - CROPPING MANAGEMENT TO REDUCE NUTRIENTS LOSSES TO WATER BODIES: THE INNOVATIVE DISTRIBUTION SYSTEMS USED

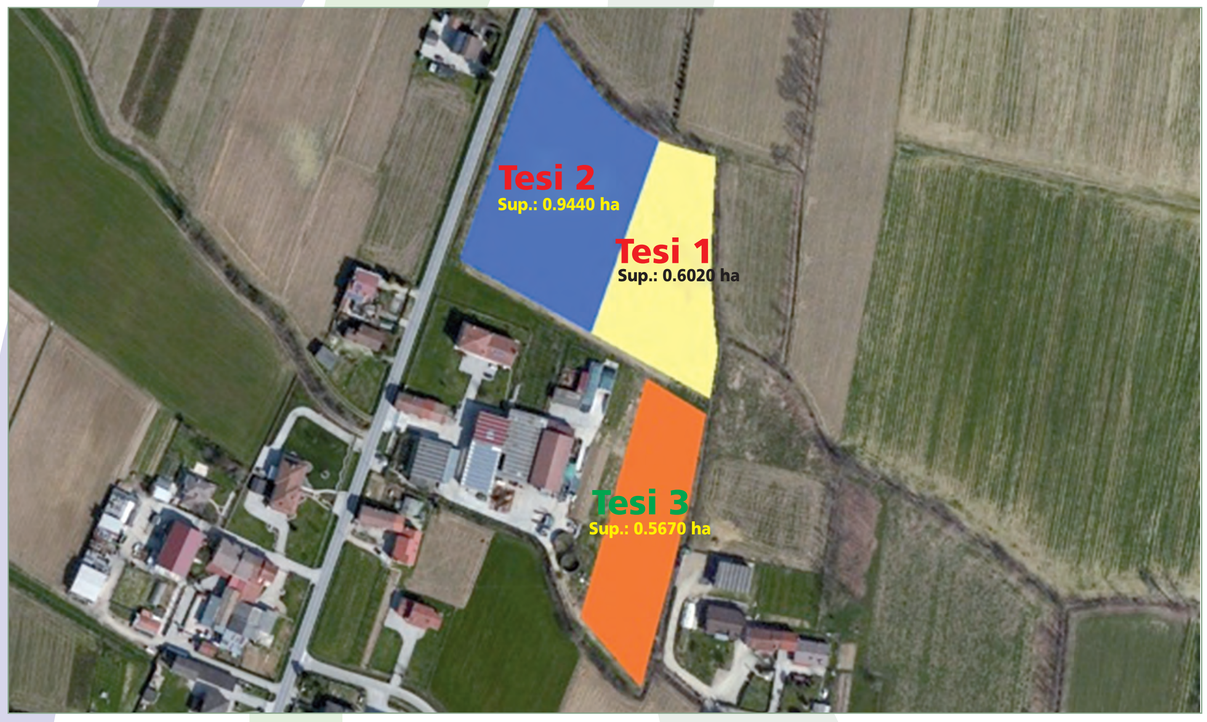
Coordinamento per il Veneto: Arduin M., Sartori A. - *Veneto Agricoltura*

Elaborazioni e testi: Luigi Sartori, Franco Gasparini, Andrea Pezzuolo - *Dipartimento Territorio e Sistemi Agro-forestali, Università degli Studi di Padova*

OBJECTIVE

To verify the farming and environmental advantages deriving from the use of slurry from animals fed with high-N efficiency rations using innovative manure application techniques on crops with high nitrogen uptake and long growing seasons.

Indicator plot	Farm	Site	Area (m^2)	Thesis
1D	Azienda pilota e dimostrativa Diana	Mogliano Veneto (TV)	6.200	Conventional manure application from beef cattle (170 kg N/ha) in fall, continuous maize
2D	Azienda pilota e dimostrativa Diana	Mogliano Veneto (TV)	1.955	Innovative manure application from beef cattle (250 kg N/ha), rotation maize-ryegrass
3D	Azienda pilota e dimostrativa Diana	Mogliano Veneto (TV)	3.790	Conventional manure application from beef cattle (170 kg N/ha) in spring, continuous maize
4D	Azienda pilota e dimostrativa Diana	Mogliano Veneto (TV)	4.500	Innovative manure application from beef cattle (250 kg N/ha), rotation maize-cover crop
1S	Azienda Agricola per vacche da latte Sgambaro Mario	Villa del Conte (PD)	6.021	Conventional manure application from dairy cattle (170 kg N/ha), continuous maize
2S	Azienda Agricola per vacche da latte Sgambaro Mario	Villa del Conte (PD)	9.436	Innovative manure application from dairy cattle (250 kg N/ha), rotation maize-ryegrass
3S	Azienda Agricola per vacche da latte Sgambaro Mario	Villa del Conte (PD)	5.672	Innovative manure application from dairy cattle (170 kg N/ha), continuous maize



TRADITIONAL MANURE APPLICATION WITH DEEP INJECTOR

Slurry is injected under the soil surface at a deep over 250 mm.
The slurry used for burying the slurry in traditional way have a load capacity of 22 m^3, the entire tank in galvanized steel with a tare weight of 10.8 tonnes. The system of loading and unloading is carried out through pressure and vacuum by means of a compressor driven by the power take of the tractor. The wagon is equipped with three-axle tires 560/60 R 22.5.
The burial of slurry is achieved through 2 deep injectors with lifting "compass" that perform tillage and deposit the slurry at a depth varying between 25 and 35 cm.
Currently are the most common means of spreading but achieve a poor homogeneity of the distribution both in longitudinal and transverse direction, with considerable difficulties in adjusting the optimal dose especially in the presence of the slope or roughness of the terrain.

INNOVATIVE APPLICATION WITH BAND SPREADER

To achieve a band application on crop coverage an experimental prototype was used, developed and tested on Diana farm of Veneto Agriculture to allow the distribution of slurry in extensive crops (in small areas), in orchards, vineyards and buffer strips namely stand or in difficult environments with rocky or full of roots or on the lawn. The distribution bar has a working width of 2.5 m, and is adaptable to small wagons precisely to avoid phenomena of compaction to the soil. The tool is connected to the wagon by two unions, the sewage is conveyed through two distributors that guarantee a uniform distribution along the bar distributor. The system is powered by a rotary vacuum pump.
The machine has worked in the field of 2D and 2S of ryegrass and maize.

INNOVATIVE SHALLOW INJECTOR WITH UMBILICAL HOSE

The slurry is fed by a drag hose to the distribution system fitted to the tractor and buried by a cultivator; the hose is supplied with slurry usually direct from the slurry store on the field side-line by a centrifugal or positive displacement pump.
The umbilical underground distribution was adopted before the sowing of ryegrass fields 2D and 2S.

INNOVATIVE SHALLOW INJECTOR ON MAIZE

The 1 axle trailer tank has a capacity of 4 m^3 and a splitter with 4 pipes. The hoes are located in a horizontal bar with a row spacing of 75 cm. Some provision must be adopted for distribution during growing season, as for example, the total mass, the narrow section of tyres, the high ground clearance and ease of manoeuvring in field.

Coordinatore

C.R.P.A.

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Partner

F.C.S.R.

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