

Description

Fertilisation optimisation



Description 3

ACTION B5. OPTIMISATION OF FIELD APPLICATION OF SLURRY

IMPROVED FERTILISATION MANAGEMENT ON A FARM

1. Choosing the farm

The farms in the study area were characterised in other project actions (A3 and B3), providing a profile of possible participating farms in this action. As a result of this work, a farm which manages 12,000 pigs on 600 ha of land in the municipalities of Albesa, Algerri and Castelló de Farfanya was chosen.

This farm, as is common in this area, uses both mineral fertilisers and livestock waste from various farms, and grows dry-farmed crops such as barley and irrigated crops such as maize, either as a monoculture or within an annual rotation after barley.

The results of the survey showed that even though fertilisation was monitored to some extent, planning could be improved considerably if a more complete record were available of the applications carried out during each season, so that the quantity, source and time of application of the fertilisers were known.



2. Objectives considered

The objectives proposed for this subaction of the project are based on two activities that will be carried out during two cereal seasons:

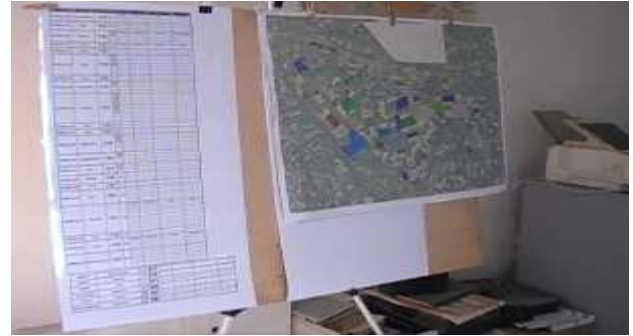
1. quantify current fertilisation management, and
2. study an improvement

Once the baseline situation has been ascertained, it will be possible to study changes to improve logistics and slurry dosage on the crops on the plots subject to monitoring.

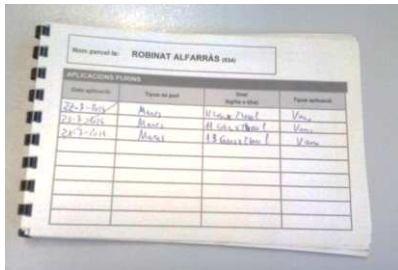
3. Development of the proposal

First, it will be necessary to quantify current management. This entails, on one hand, identifying the livestock farms that supply the organic fertilisers that are later applied on the fields and, on the other hand, locating all the plots that receive or may receive both chemical and organic fertilisers. Furthermore, this must be done accurately as, on large farms, the fertiliser is applied on all the plots over a period of just a few days.

To make the task easier, the farm's technical manager is recommended to record all applications in tables with the help of maps that group the plots in units that they are familiar with.

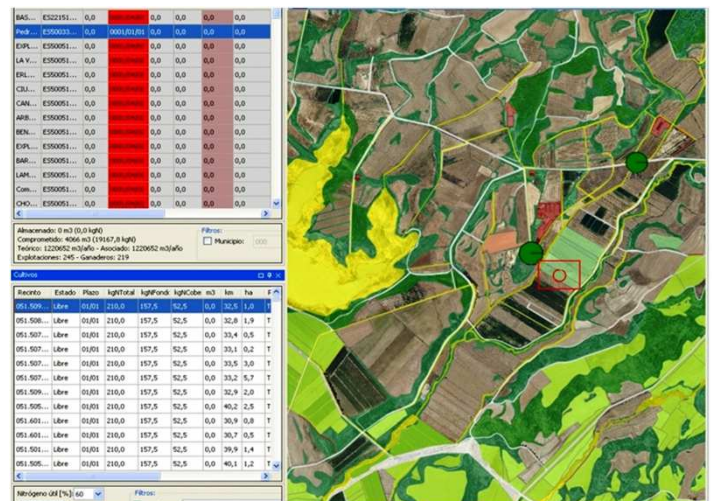


It is also necessary to involve the people that transport or apply the slurry, so that they keep a record of all the applications made, including the date, source farm, tank used and plot on which it is applied. Each applicator is given a notebook in which to write down this data.



APLICACIONES PURINAS			
Data aplicació	Tipus de purí	Dosi (kg/ha o l/ha)	Tipus aplicació

In order to optimise distribution of applications by farms on the crop plots, it has been decided to use the GEMA software developed by the public sector company SARGA through the LIFE ES-WAMAR project. This software provides a means of visualising the livestock farms and helps locate the plots on which it is wished to apply organic fertiliser. Optimising slurry application and shortening application distances may lead to significant financial savings.



4. Characterisation of the farm operation

Farms

The operation has three pig farms with breeding sows and fattening pigs located close to the fields on which the livestock waste is applied. Slurry from other farms may also be applied. This makes it difficult to know the exact source of the fertiliser applied on the land.



Plots

The operation currently manages a total of 179 enclosures that comprise a total of 591 ha. To make it easier to identify the fields and ascertain the fertilisation practices that have been implemented during the season, the enclosures have been grouped into plots that are managed in a similar manner. As a result, from 179 enclosures with an average area of 3.3 ha, we are now dealing with 113 plots with an average area of 5.2 ha.

At the same time, the work has been divided into three main areas, two dry farmland and one irrigated. The irrigated area has most arable hectares with 395 ha, while the other two areas total 107 and 88 ha, respectively. The number of plots is distributed evenly between all three areas, with 37 plots on irrigated land and 40 and 36 on dry farmland. Regarding plot size, the average is 10.7 ha in the irrigated area and 3.0 and 2.2 ha, respectively, in the dry-farmed areas.

As regards crop distribution, maize is the main crop in the irrigated area, with 71%. Monoculture accounts for 58% of the crops while 42% are rotated annually, normally being sowed after barley. In the dry-farmed areas, 68% is used to grow barley, with wheat, rapeseed and fallow accounting for the rest.

Fertilisers used

In the case of organic fertilisers, the operation uses mostly pig slurry, either its own or occasionally from other farms in the area. To ascertain slurry content, samples taken from the various farms at different times during the year have been analysed.

Farm	Kg N/m ³	Kg P ₂ O ₅ /m ³	Kg K ₂ O/m ³
1	1.3	0.2	1.2
2	0.8	0.1	0.7
3	5.4	8.2	1.8

In the case of mineral fertilisers, several types are used depending on the crop, the fertiliser application time and system, as described in the table below:

Irrigated crop	Time of application	Mineral fertiliser	Dry-farmed crop	Time of application	Mineral fertiliser
Maize	Basic dressing	DAP 18-46-0 KCl 60%	Barley	Basic dressing	8-8-12
Maize	Cover dressing	N32	Rapeseed	Basic dressing	8-15-15
			Barley/rapeseed	Cover dressing	NSA 26%