

- Abandonment of tillage, or reduced soil tillage and use self-sown rape for ground cover: Here the ground cover and lack of cultivation reduce nitrate leaching.



- Abandonment of tillage after maize or sugar-beet when followed by summer crop: The main effect is a reduction of nitrogen mineralisation in the autumn.
- Limited period for application of organic/secondary raw material fertilisers: The measure prevents application of excess nutrient at times when plant requirements are low and/or nitrate leaching risk is high.

The “Results-oriented Measure”

The purpose of this new measure is an improvement in nitrogen management for the entire farm. The measure rewards the improvement in a farm’s nitrogen utilisation. The farmer can decide for himself how to optimise nitrogen management on his farm – with advice and support if necessary.

Scope of measures and review of progress

More than fifty model farms are taking part in the implementation of the measures. Measures covering a total of around 5000 hectares were completed between autumn 2006 and autumn 2007. The environmental benefits of the measures are determined at farm level by making field studies (e.g. Soil Mineral Nitrogen) and preparing nutrient balances. At area level the economic and environmental impacts of implemented measures are assessed with the aid of models.

Integration in agro-environmental programmes

Finally, the measures tested are put together to form a programme of measures and are then to be integrated in state agro-environmental programmes. The programme of measures is drawn up in close consultation with the Ministry of Agriculture.

For further information:

Project Websites:

www.wagrigo.de

www.wagrigo.org

WAgriCo Overall Coordination

Dr. Astrid Krüger

Astrid.Krueger@nlwkn-dir.niedersachsen.de

www.nlwkn.de

WAgriCo Technical Coordination

Hubertus Schültken

Hubertus.Schueltken@nlwkn-

h.niedersachsen.de



WAgriCo

Water Resources
Management in **Cooperation**
with **Agriculture**

A Water Framework Directive
Project



Water Conservation in
Agriculture: A Practical Test

Catalogue of Measures



Niedersachsen

WAgriCo

The WAgriCo project supports the development of appropriate programmes of measures for state-wide implementation of the Water Framework Directive. Proven water conservation measures are tested for large-scale feasibility for the purpose of a management plan. The measures designed in the WAgriCo project are being tested in the three pilot areas “Lager Hase” (Weser-Ems), “Ilmenau Jeetzel” (Lüneburg) and “Große Aue” (Nienburg, Diepholz) in Lower Saxony. The choice of pilot areas, which display considerable differences in landscape, land use and the problems encountered, ensures the development of methods suitable for state-wide application.

Development of measures

A catalogue of autumn and spring measures has been drawn up in cooperation with farmers at local level on the basis of proven agro-environmental measures and voluntary agreements in the field of drinking water protection. This catalogue comprises a total of thirteen action-oriented measures for agricultural land use, plus one “results-oriented” measure. While developing and advancing the described measures emphasis is laid on a high degree of:

- environmental benefits
- economic efficiency
- acceptance and implementation

The “Results-oriented Measure” is a new category of water protection measures in Lower Saxony which has been developed in the WAgriCo project.

Overview of spring measures

- Slurry application on grain and rape fields, ley fields and grassland using towed-hose, drag shoe or slot techniques: This improves nitrogen utilisation from organic manure and helps to save mineral fertiliser.



- Spring use of “nitrogen-stabilised mineral fertiliser” for winter grain and potatoes: Using a nitrogen stabiliser means that, depending on the temperature, no more ammonium is converted into nitrate than is needed by the plants. This reduces nitrate leaching, especially on sandy soils, and improves nitrogen efficiency.
- Close sowing of maize, i.e. sowing with a reduced row width and an increased distance within the rows: This causes a more uniform and more efficient exploitation of the water and nutrients in the soil by the maize roots. The result is better ground cover and hence reduced nitrate leaching.

- Use of the “CULTAN method” for grain: Here an injection unit applies highly concentrated pure liquid ammonium fertiliser close to the roots. The plants draw their nutrition solely from the ammonium. Since in this case the ammonium is not converted to nitrate in the soil, this prevents nitrate leaching as long as the plants are growing. It also improves nitrogen efficiency.
- Undersown crops (e.g. grass) in silage maize continue to grow between the maize stubble after the maize has been harvested, providing green cover and reducing nitrate leaching during the winter period.

Overview of autumn measures

- Catch crops (winter-hardy or non-winter-hardy): The measure conserves nitrate in the biomass during the winter and is very effective against nitrate leaching.
- Winter turnips as summer catch crop before winter grain: Thanks to intermediate storage in the biomass and in the soil, the measure minimises nitrate leaching.
- Greening with self-sown rye and triticale: Shallow tilling is permitted directly after the harvest to encourage emergence of ground cover. The combination of vegetation and low tillage results in reduced nitrate leaching.
- Three-year fallow with active greening: Thanks to fixation of nitrogen in the plants and the lack of cultivation, nitrogen is kept in the topsoil for several years and not washed out.