



## **Demonstration projects Part of task 3.2 of the EU-LIFE project AGWAPLAN**

LIFE05 ENV/DK/000155: Integrated Protection of Surface and Groundwater in Agricultural Regions (AGWAPLAN)

English Summary

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## SUMMARY

As part of task 3.2 of the AGWAPLAN project, demonstration projects aiming to reduce nutrient losses have been discussed and initiated in all three catchment areas.

In the Hinnerup groundwater catchment which is vulnerable to nitrate leaching, the demonstration activities have focused on the use of catch crops. The effect of various types of catch crops has been evaluated through measurements of mineral nitrogen (N<sub>min</sub>) in the root zone after the growing season in 2007. Results show that catch crops can reduce the level of mineral nitrogen in the root zone after the growing season. The effectiveness, however, strongly depends on how well and how early the catch crop is established. In three out of four fields with catch crops, there was a significant effect on the mineral nitrogen content in the soil compared to the reference field without catch crops. In one field, the catch crop, however, did not seem to have any influence on the nitrogen level, which was very low in both the reference crop and in the catch crop.

In the catchment of Norsminde Fjord, where the primary goal is to reduce nitrogen load to the Fjord, an artificial pond has been established during February-March 2008 which is expected to remove a part of the nitrogen and phosphorus from the stream water, which is passing through the pond. A monitoring programme was established during the summer of 2008. In small sorbicells placed in the pond inlet and outlet nitrogen and phosphorus are attached to a chemical tracer in a flow proportional way allowing calculations of an average (monthly) concentration in the water. As a supplement, measurements of water level in the inlet to the pond have been carried out on a daily basis using an electronic transducer in order to verify the water balance. In this way the monitoring system will make it possible to calculate the retention of nitrogen and phosphorus in the pond. Furthermore, water samples have been taken regularly upstream and downstream the pond during autumn 2008 with the purpose of evaluating potential negative effects on water quality in the stream. The water samples were analyzed for content of NH<sub>4</sub>, NO<sub>3</sub>, Total N, Ortho-P, total-P, BI5, oxygen and pH. Preliminary results indicate that both nitrogen and phosphorus has been partly removed in the pond during the autumn 2008, but it is too early to make final conclusions regarding the effectivity of the pond during a longer period. The pond will continue to serve as a demonstration project for other farmers in Denmark.

In the catchment of Lake Ravn, where the primary goal is to reduce phosphorus load to the Fjord, farmers have discussed reestablishment of a drained lake in order to enhance nitrogen and possibly phosphorus removal in the catchment area of Lake Ravn. In 2007 investigations of the content of easily extractable phosphorus and the Fe/P-ratio of soil samples was carried out in the potentially flooded area in order to evaluate the risk of increased P-release during flooding. The stream and the lake itself have been monitored during the winter 2007-2008 in order to provide information for recommendations for future land use. Unfortunately, the project was not carried out, because one farmer was too concerned about potential negative effects for the future use of his land. This type of investigations will, however, improve decision-making in similar projects in Denmark.

In all three catchment areas, the demonstration projects have helped creating interest in the AGWAPLAN-project beyond the partners actively involved in the project. In the Hinnerup area, the catch crop project has been presented to other farmers in the area through visits to the fields. In the Norsminde area, the artificial pond has been visited by a number of groups representing both the agricultural sector and environmental authorities, and the establishment of the pond was described in a local news paper. In the Lake Ravn catchment area, the project aiming to restore the drained lake, has naturally involved more farmers than were actively involved in the AGWAPLAN-project, because the restoration would influence all farmers with agricultural land in the drained lake.