



Controlled drainage as a measure to reduce the outlet of nitrogen to the aquatic environment

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Research and demonstration activities have been initiated in Denmark in order to investigate controlled drainage as a measure to reduce the outlet of nitrogen to the aquatic environment. In 2012 four research and demonstrations sites were set up. In 2013 two more sites will be set up. Different soil types and drainage systems are represented. Controlled drainage has not previously been tested in Denmark. According to literature the effects of controlled drainage in combination with spring sown crops are quite well known. Controlled drainage will in this new project be tested in a winter wheat cropping system. Controlled drainage is considered to be an alternative measure to catch crops and/or reduced nitrogen quotas in order to meet the goals of the Water Framework Directive. Before controlled drainage can be implemented in Danish agriculture as a recognised nitrogen measure several questions have to be answered:

1. Acceptable water table level on autumn sown fields without negative impacts.
2. Effects on crop production, root growth, and nitrogen balance.
3. Effects on the outlet of nitrogen and phosphorous to the aquatic environment under Danish crop growing conditions.
4. Effects on the subsurface drainage system. Sedimentation in drain pipes.
5. Effects on greenhouse gas emissions, especially nitrous oxide.
6. Design of subsurface controll wells and guidelines for water table management.
7. Characterization of suitable areas for controlled drainage.
8. Cost effectiveness compared to other nitrogen measures.

Some preliminary results will be presented.