

Alfalfa and water: prevention is better *than cure*

Alfalfa, as a plant with water cleansing properties, can be considered an essential ally in preserving the quality of water resources. A recent summary document* highlighted the impact of this legume on quality indicators for water percolating to the water table in the Champagne-Ardenne region.

The regulatory context

The CAP Health Check

In early 2009, the Council of the European Union decided to abolish direct support for dehydrated alfalfa, beginning with the 2012 harvest. This would mean the premiums previously paid to dehydrated alfalfa producers being integrated into the SFP (Single Farm Payment). Farmers will therefore be encouraged to decide on their crop rotation on the sole basis of the price offered to them by the market. Given the very poor return on alfalfa, many farmers are likely to cease producing this crop.

Water Framework Directive 2000/60/EC

In the European Union, the Framework Directive manages domestic surface, ground, transitional and coastal waters in order to prevent and reduce water pollution, promote sustainable use of water, protect the environment and improve the condition of aquatic ecosystems as well as mitigate the effects of flooding and drought. Member States are committed to protecting and, where necessary, restoring water quality. On many occasions, France has been reminded of its responsibilities in this respect and is striving to put adequate measures in place.

Preserving and restoring water quality is a fundamental challenge for France.

➤ Combating diffuse pollution resulting from agriculture (nitrates and plant protection products) is one of the priority actions for the country, as confirmed by the Grenelle Environment Forum.

➤ Where alfalfa is grown, it provides a recognised, reliable and economically sustainable response to regaining control over water quality. The authors of the summary document illustrate this, highlighting the different benefits of the crop:

- There is absolutely no need to apply nitrogen fertilisers as the crop is able to fix nitrogen from the air;
- It has a cleansing effect on nitrates present in the soil before plantation;
- It is able to absorb and make use of effluent from the agri-food industry and livestock;
- It provides a source of nitrogen for the subsequent crop, which limits the need for external application WITHOUT CAUSING NITRATE RUN-OFF AFTER PLOWING;
- There is little need for pesticides.

➤ In conclusion, alfalfa is not only essential for agronomic challenges (varied rotations, extended rotations, soil protection and structuring) but it also offers many advantages for the environment (removal of mineral nitrogen through leaching, use of effluent, positive impact on biodiversity, etc.). It is also of strategic and economic importance given that Europe needs to restore its protein supply independence for feeding livestock which is primarily fed on imported soya.

➤ Alfalfa production therefore needs to be encouraged by all actors in order to restore the quality of drinking water and to help maintain a balanced environment.



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QUESTIONS/ANSWERS



What are the risks of nitrate run-off from growing alfalfa?

Extracts from the summary document «Alfalfa and Water Quality» from November 2009

A wealth of work carried out by Inra (French Institute for Agronomic Research) in Châlons-en-Champagne and Reims, has revealed that:

- a) Given the pedo-climatic conditions in this region, in comparison to other crops (beet, wheat, etc.), introducing alfalfa into the crop sequence lowers the concentration of nitrates in drainage water from the crop rotation (Denys et al., 1990 ; Beaudouin et al., 1992 ; Muller et al., 1993);
- b) Ploughing alfalfa does not cause the untimely release of nitrogen (and therefore nitrates). Indeed, contrary to widely held beliefs, incorporation of

the nitrogen present in the roots and crown (part above ground which is not harvested) results in the mineral nitrogen from the soil being organised by micro-organisms before being progressively re-mineralised, particularly during the subsequent spring (Justes et al., 2001). The effect of this was measured over the course of at least two marketing years (Beaudoin et al., 1992 ; Justes et al., 2001). Muller et al. (1993) reports a 10-year after-effect subsequent to ploughing for alfalfa subject to ¹⁵N isotopic labelling. There is therefore a low risk of nitrogen run-off from growing alfalfa, which is an asset for arable regions and beneficial for the environment.

What are the effects of nitrogen on the yield and quality of harvested fodder?

The ability of alfalfa to absorb mineral nitrogen is put to use in arable regions in order to manage livestock effluent stocks and waste water generated by agri-industrial processes (Muller et Ledain, 1992). Experiments and monitoring of

such practice have been carried out, always coming to the same conclusions: nitrogen fertilisation, mineral or by organic products, has no effect on yield or on the nitrogen content of the harvested fodder (Thiébeau et al., 2004).

Use of plant protection products and alfalfa: what, how much, when?

In 2009, the results of a study carried out jointly by CDER 51, Chamber of Agriculture 51 and COOP de France Déshydratation revealed that alfalfa is a hardy plant which requires little, if any treatment. Almost no insecticides: 94 % of land areas during the 1st year and 97 % of land areas during the 2nd year did not require insecticides. Pre-cutting at 40 to 45 days helps to regulate the development of insects. Few herbicide treatments: herbicide treatments are used during the planting stage to help ensure the best conditions for growing and to guarantee the survival of the crop. There is therefore less need for treatment during the

year as alfalfa has a naturally strong ability to cover, suppressing the emergence of pests. 72 % of land areas during the 1st year and 68 % of land areas during the 2nd year did not require any application of broadleaf herbicides. No fungicides: breeding research over the last 30 years has made effective progress in terms of natural tolerance to diseases - Verticillium, Sclerotinia, Anthracnose. Furthermore, regularly cutting the same parcel of land prevents potentially problematic situations from arising. Ultimately, the soil left behind by alfalfa for the next crop has a lower stock of weed seeds, limiting the application of plant protection products. Consequently, growing alfalfa significantly reduces the need for pesticides in arable regions.

Alfalfa and biodiversity: how are they related?

They are related in many ways. As it covers the soil over the entire year, alfalfa provides a natural refuge for both micro and macro underground, surface and air-borne fauna. It can be continually pollinated, in particular during the summer months when pollen resources can become especially scarce in arable

regions. A recent study carried out in partnership with the National Natural History Museum and nature defence associations revealed that all indicators (birds, butterflies, crickets-grasshoppers, bats, bees, etc.) are significantly higher in parcels where alfalfa is grown, as compared to parcels where cereals are grown.



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www.luzernes.org

Courrier de l'environnement de l'INRA N° 49 June 2003 Thiébeau and al : «What future for Alfalfa in France and in Europe» and n°54 september 2007 Decourtye and al: «Introduction of floral fallows in arable crop areas: how to reconcile agriculture, biodiversity and beekeeping»

Documents available in French on www.inra.fr