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ALFALFA

The answer to forage production under climate change

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2018 was without doubt an extreme year and yet there is no denying climate change. A relatively drought-tolerant forage crop is alfalfa which is also known to be an excellent supplier of protein. So could alfalfa be the solution as a forage crop that performs well in a hotter climate?

Alfalfa is an excellent supplier of protein and can reduce dependency on expensive bought-in protein. As well as having a high nutritional value, it also has a positive impact on animal health. For instance, it prevents rumen acidosis, improves the consistency of faeces and due to it high fibre content, promotes digestion and rumination. It contains high concentrations of vitamins and minerals which stimulate the animals' metabolism. With a high beta-carotene content, it also has a positive effect on fertility.

Basic rules to encourage good persistence

1. Allow a break of more than 7 weeks between the penultimate and last cut.
2. Avoid cutting alfalfa between 10 August and 20 (25) September.
3. If possible, avoid cutting the first regrowth in the sowing year before the flowering stage. (Root penetration is approx. 5 cm per day during the vegetative stage. Under optimum conditions, alfalfa roots can extend to a depth of over 10 m.)
4. Cut all further regrowth when 2 to 3 yellow leaves appear at the base of the stem, regardless of the stage of development, or at the start of flowering at the latest. Take care not to cut alfalfa too close and avoid damaging the growing points to ensure rapid reshooting.

Demanding requirements

Growing alfalfa successfully places high demands on the soil which should be deep, easily rootable, free-draining and warm. Alfalfa does not respond well to plough pans, surface soil compaction and hardpan crusting.

Waterlogged, poorly oxygenated, cold soils or soils prone to late frosts are unsuitable for growing alfalfa. The soil pH must be at least 5.8. The water demand is approx. 500–650 mm per kg DM. Alfalfa has such a deep root system that it can obtain approx. 50 % of its water and nutrient requirements from the subsoil. It requires an average annual temperature of approx. 7.6 °C.

To obtain the most reliable results it is best to sow in spring after autumn ploughing. The optimum sowing period is early April, although the sowing window can be extended to mid-August. 40 kg/ha oats or 5–8 kg/ha annual ryegrass make a suitable cover crop in the spring. Direct sowing is recommended for summer sowings. The seedbed should be well broken down and consolidated, the seed rate should be 18–25 kg/ha and the optimum depth is 1–2 cm.

The importance of early growth

To encourage symbiosis between rhizobia and legumes right from the point of germination, DSV legumes in all Country mixes are treated with DynaSeed LegumeMaxx, an innovative seed treatment for alfalfa and clover species. DynaSeed contains specifically selected bacteria (rhizobia) which are embedded in a tailored combination of nutrients. The carefully balanced formulation stimulates the first root hairs even during germination and so promotes symbiosis.

A lime application before sowing is beneficial even with a pH above 5.8. This will encourage the germination and early growth of alfalfa. The phosphate content should at all means be equivalent to supply levels in the C range. Phosphoric acid is very important for the germination and early growth of alfalfa. Together with calcium, it plays an important role in stimulating the growth and activity of nodule bacteria and thus the protein content and overall performance of the plant. The potassium content, like the phosphorus content, should also lie within the range of the C supply. On marginal sites it is particularly important to ensure a good supply of potassium. This is because among other things, potassium controls photosynthesis (even in storage tissue) and is therefore very important for protein-rich alfalfa. It is removed at a rate of approx. 3.5 kg/K_2O per dt DM. Since nodule bacteria enable alfalfa to fix atmospheric nitrogen, no nitrogen fertilisation is required, although it would benefit from an initial input of 20–30 kg N/ha. Alfalfa is particularly sensitive to a molybdenum deficiency. Molybdenum is essential for the formation of nitrate reductase. It is particularly important to supply molybdenum to soils with a low pH. In such cases it is advisable to apply a sodium molybdate fertiliser which is also allowed in organic farming.

Management and harvesting

High yields are obtained when the alfalfa has an optimum number of vigorous, well-distributed individual plants.

Established guideline values:

- > 350–400 plants/m² soon after emergence
- > 300–350 plants/m² in the sowing year after the first cut
- > 200–220 plants/m² after the first winter, before the first cut
- > 120–150 plants/m² after the second winter, before the first cut
- > 80–100 plants/m² after the third winter, before the first cut

Since alfalfa is very sensitive to pressure, it is important to apply as little traffic pressure as possible during field work to avoid plant losses. One means of avoiding pressure is to establish permanent tramlines for the harvesting equipment.

Low-loss harvest

Alfalfa has a very poor sugar-to-buffering capacity ratio (0.6) and therefore must be left to wilt down to approx. 40 % DM before ensiling. This is the only way to ensure optimal fermentation in the clamp. Gentle turning is also extremely important for a low-loss harvest. Molasses or lactic acid bacteria can be added to improve the fermentability of alfalfa.

Alfalfa-grass mix – an alternative to growing alfalfa as a single crop

An alfalfa-grass mix offers several important advantages over a monocrop. These include greater flexibility during harvesting, easier ensiling, better trafficability and last but not least, higher energy yields. However, this cropping system is not without its disadvantages. The main drawbacks are the difficulties associated with managing the grass crop, the need for N fertilisation and the limited choice of suitable sites due to the water requirements of the grasses.

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