ESTABLISHING ALFALFA, A KEY PHASE IN THE CROP CYCLE

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Alfalfa is the most widely grown legume forage without association in France, but its success and sustainability depend largely on the quality of its establishment. In addition to the variety, which must be adapted to the soil and climate conditions of the environment (particularly dormancy), the selected plot (soil type, sensitivity to waterlogging, etc.), the sowing schedule (period, dose, etc.) and its mineral requirements are the main points to consider.

Choosing a plot suitable for cultivation

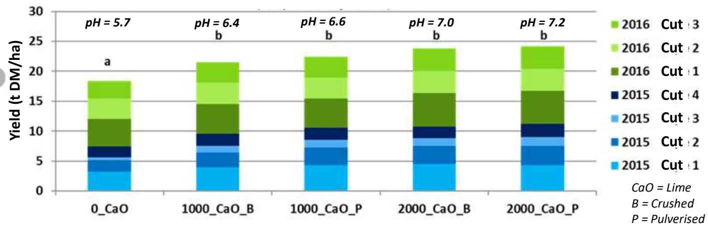
Healthy soils and structures will be more suitable for alfalfa cultivation. Soil aeration promotes symbiosis between *Rhizobium* bacteria (naturally present in soils) and alfalfa.

Any soil compaction will prevent the legume from establishing itself properly and will impact its productivity and lifespan on the plot → Poor rooting and reduced nodule development. Alfalfa is also very sensitive to waterlogged conditions.

Soil type / Structure	Sandy	Limestone	Healthy loam-clay	Hydromorphic silt loam
Compact		Unfavourable	Unfavourable	Very unfavourable
Good structure	Suitable if pH is sufficient	Highly suitable	Highly suitable	Suitable

Summary table showing the suitability of a plot for growing alfalfa based on soil type and structure

Acidic soils with a pH value below 6 should be avoided. For plots below this value, *liming* is a solution to consider in order to raise the pH. This will improve alfalfa production, particularly in the first cuts, without impacting its nutritional value for use as fodder.



Cumulative yield and contribution of each cut (adjusted averages), results of Arvalis trials conducted between 2014 and 2016 at the Jaillière station (44)

Sowing schedule

2 periods for sowing

Late summer sowing

- Ensure good production levels from the first year, onwards,
- Weeding possible before winter,
- Must reach **the 2-3 trifoliate leaves stage before the first frosts.**

In mainland France :
No sowing after 30 September. Gradient for the sowing deadline from 31 August in the East to 30 September in the West.

→ Sensitivity of alfalfa to frost and shorter days.

Spring sowing

- **-50% yield** in the **first year**,
- Reduced pressure from weeds,
- Better alfalfa establishment **but beware of late frosts.**

Preparation of the soil to be adapted according to the issues encountered on the plot : *ploughing* (weed management, parasitism) and *simplified sowing* to ensure a good seedbed and good productivity.

Sowing rate : **25 kg/ha** at the end of summer / **20 kg/ha** in spring
Sowing depth : **1 cm** → Do not go below 2 cm, otherwise the germination rate will decrease.

Tassement / Epoque de semis	Printemps	Eté
Cultipaker	100	100
Absence	75	54

Alfalfa density (plants/m²) according to compaction; source : Improving Alfalfa Production, USA, 1989

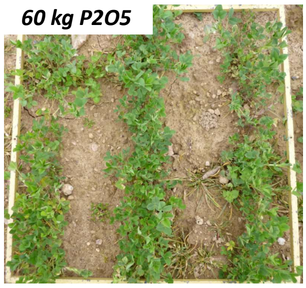
It is essential to press down the soil after sowing.

In spring, it is also possible to sow alfalfa under cover of a cereal crop to limit weed growth, ensure dual production (fodder/grain) and reduce sowing costs.

Mineral requirements

Alfalfa is a crop that requires high levels of potassium (K_2O) and **very high levels of phosphorus** (P_2O_5).

Trials conducted at Arvalis in the 2010s (*La Jaillière - 44*), in soils with low P_2O_5 content, showed that phosphorus nutrition for the crop from sowing onwards is important in terms of both quality and quantity.



Pictures : 27/03/2013

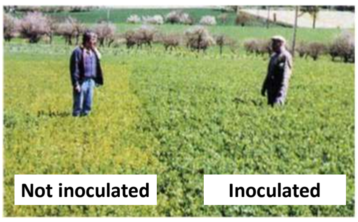
***+ 2 t DM/ha** between unfertilised and an application of **120 kg P2O5** per hectare on the first two cuts combined*

Dose P205 (kg/ha) =>			0	30	60	90	120
10/06/2013	Cut 1	MAT (% DM)	**12.58 b**	**13.86 ab**	**15.49 a**	**15.54 a**	**15.62 a**
		MAT (kg/ha)	**294 c**	**361 bc**	**444 ab**	**511 a**	**542 a**

***+ Increase in the protein content** of alfalfa with phosphorus supplementation at sowing*

Importance of inoculation at sowing with *Rhizobium* bacteria, especially in acidic (pH<6), or waterlogged or drying soils, low organic matter content or which have not been used to grow legumes for some time (more than 10 years) → Many seeds are now sold pre-inoculated.

Weeding at the end of summer sowing depending on weed pressure = **Interest for less competition and increased production in the first year.**



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