Alfalfa to get back into planetary boundaries

2025 world alfalfa congress
FRANCE REIMS-CHÂLONS

Agronomic session

Honoré LABANCA

Practical workshop session 1

FROM 03 TO 06 nov. 2025

Alfalfa to get back into planetary boundaries

2025 world alfalfa congress
FRANCE REIMS-CHÂLONS

Genetic progress in alfalfa in France

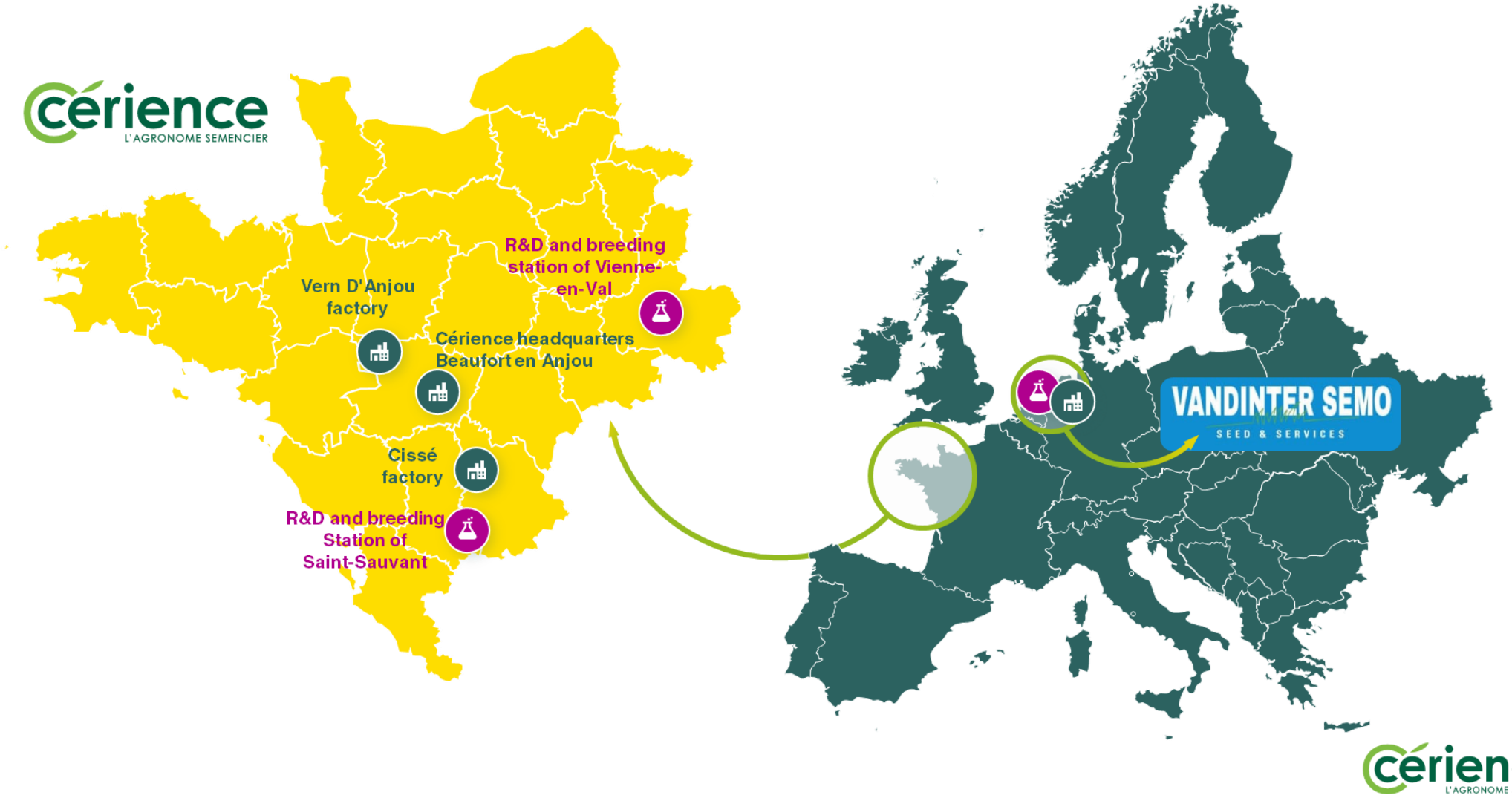
Sandrine FLAJOULOT

Cérience L'AGRONOME SEMENCIER

GIE GRASS

FROM 03 TO 06 nov. 2025

Our locations in Europe



Our 3 fields of expertise

SEED BREEDING

- Alfalfa
- Forage seeds
- Forage mixes
- Cover crops
- White lupin, maize & oil seed rape

PRODUCTION & SERVICES

- Seed Production
- Treat & Pack
- Seed technology
- Supply

SOLUTIONS

- Adjuvants
- Biocontrol products
- Seed technology
- Rhizobium

Breeding species : fodder and cover crops

- Crimson clover
- Berseem clover
- Birdsfoot trefoil
- Common vetch
- Hairy vetch
- Purple vetch
- Avena strigosa
- Perennial rye
- Sinapis alba
- Brassica carinata
- Raphanus sativus
- Forage Peas
- Lupin

GIE GRASS

- **Alfalfa**
- Cocksfoot
- Tall Fescue
- Perennial ray grass
- Hybrid ray grass
- Italian ray grass

Economic Interest Grouping including :

- 3 seed companies : Cérience, Lidea, Graines Loras
- 2 cooperatives : CAVAC, Oxyane

Gie GRASS : Alfalfa breeding

60 years of expertise in varietal breeding

Dormancy 2 to 8

43 varieties registered since 2000

- 27 registrations in the French
  →1/3 of the French catalog

- 16 registrations abroad

Evolution of registration characters in France

1978	1994	1995	2005	2007	2011	2012	2016
Total Yield	Total Yield	2 Total Yield	2 Total Yield	~~Total Yield~~	Total Yield	Total Yield	Total Yield
Yield A2	Yield A2	Yield A2	Yield A2	0,8 Yield A2	0,8 Yield A2	0,8 Yield A2	0,8 Yield A2
Yield A3	Yield A3	Yield A3	Yield A3	1,2 Yield A3	1,2 Yield A3	1,2 Yield A3	1,2 Yield A3
Yield C1 (A2+A3)	Yield C1 (A2+A3)	Yield C1 (A2+A3)	Yield C1 (A2+A3)	Yield C1 (A2+A3)	Yield C1 (A2+A3)	Yield C1 (A2+A3)	Yield C1 (A2+A3)
Fall yield (A2+A3)	Fall yield (A2+A3)	Fall yield (A2+A3)	Fall yield (A2+A3)	Fall yield (A2+A3)	Fall yield (A2+A3)	Fall yield (A2+A3)	Fall yield (A2+A3)
Protein content	Protein content	1 Protein content	1 Protein content	0,6 Protein content	0,6 Protein content	0,6 Protein content	0,6 Protein content
				0,6 Digestibility (ADF)	0,6 Digestibility (ADF)	0,6 Digestibility (ADF)	0,6 Digestibility (ADF)
Verticillium	Verticillium	3 Verticillium	3 Verticillium	3 Verticillium	3 Verticillium	3 Verticillium	3 Verticillium
Anthracnose	Anthracnose	Anthracnose	Anthracnose	1 Anthracnose	1 Anthracnose	1 Anthracnose	1 Anthracnose
	Nematode	0,1 Nematode	0,1 Nematode	0,1 Nématode	0,1 Nématode	1,25 Nématode	1,25 Nématode
Lodging	Lodging	2 Lodging	2 Lodging	2 Lodging	2 Lodging	2 Lodging	2 Lodging
		Coefficients	Coefficients	Coefficients	Coefficients	Coefficients	Coefficients

Visual field ratings

Controlled conditions tests

In red, changes

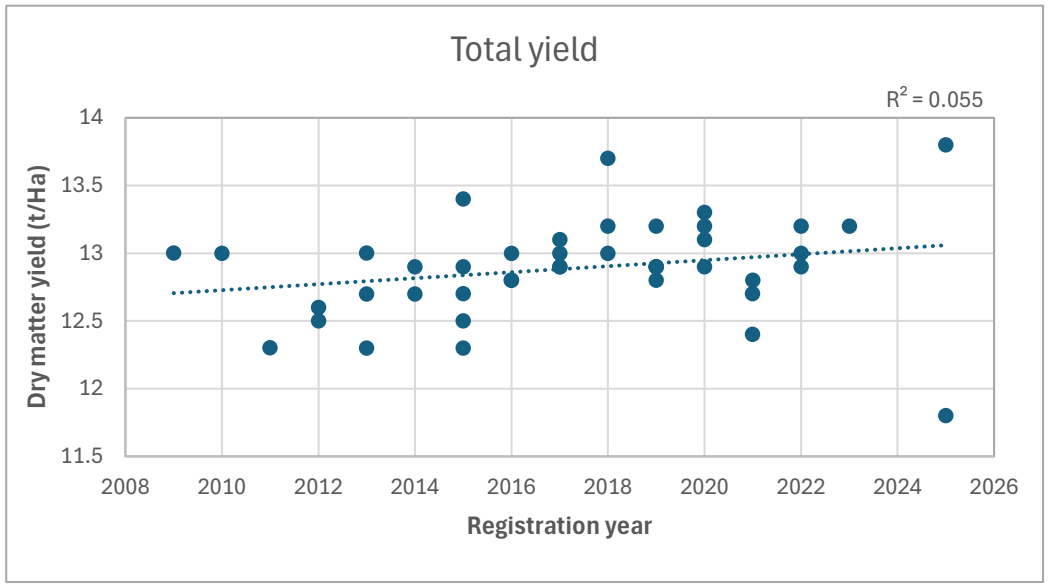
-> Registration criteria have evolved to meet user expectations and promote genetic progress.

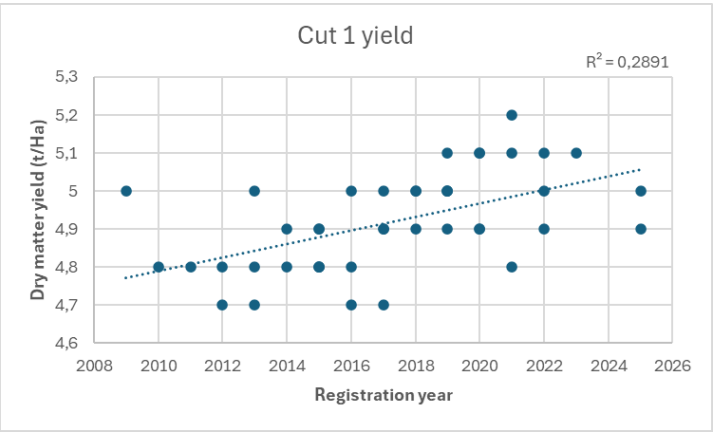
-> Use of higher or lower coefficients for the most important characteristics

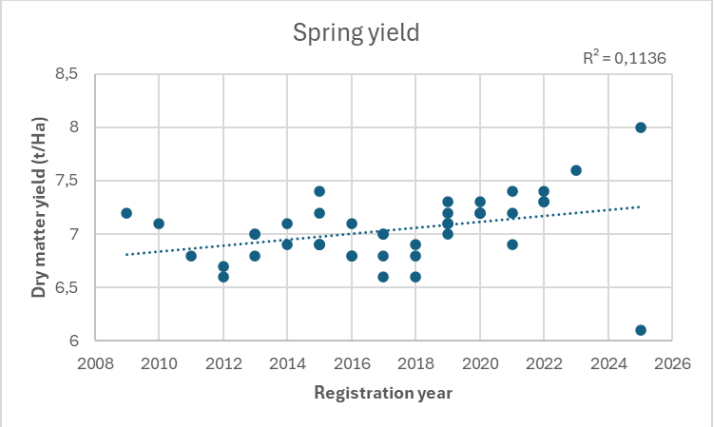
Yields evolution In the French varieties

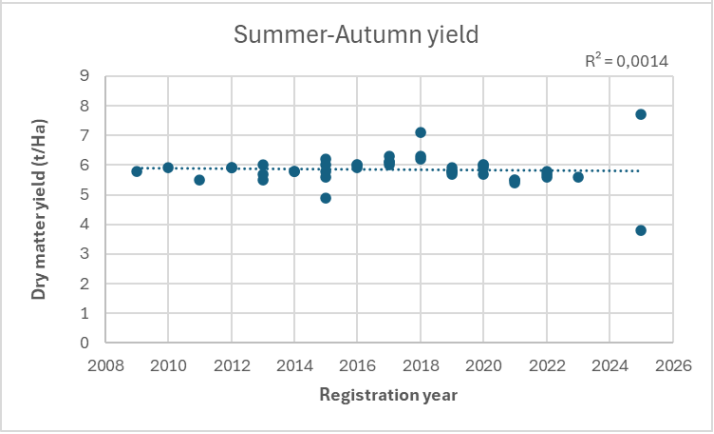
Herbe-Book data (https://herbe-book.org/): all varieties listed in the French catalog since 2009

Statistical analyses used: mixed model based on a large dataset (cultivated variety, location, year) allowing comparison between untested varieties.









➔ **Increased total yield**

- Increased yields from first cut and spring cuts
- No improve in fall yield

Feed quality evolution In the French varieties

CHRONOLOGY:

1978 Protein content is included as a quality trait in variety evaluation by CTPS and coefficient in 1995

1997-1999 Contract ACVF-INRAe: «*Genetic improvement of alfalfa digestibility* »

-> Bulding of NIRS equations to predict biochemical composition

2000-2002 Contract GEVES-INRAe-ACVF-LCA Luzerne de France: «*Energy value and registration of alfalfa varieties in the French catalogue*»

2007 ADF content is included as a quality trait in variety evaluation by CTPS

ACVF ASSOCIATION DES CRÉATEURS DE VARIÉTÉS FOURRAGÈRES
Association of French fodder variety creators : Barenbrug, DLF, DSV, Cérience/Gie GRASS, RAGT, Semences de France

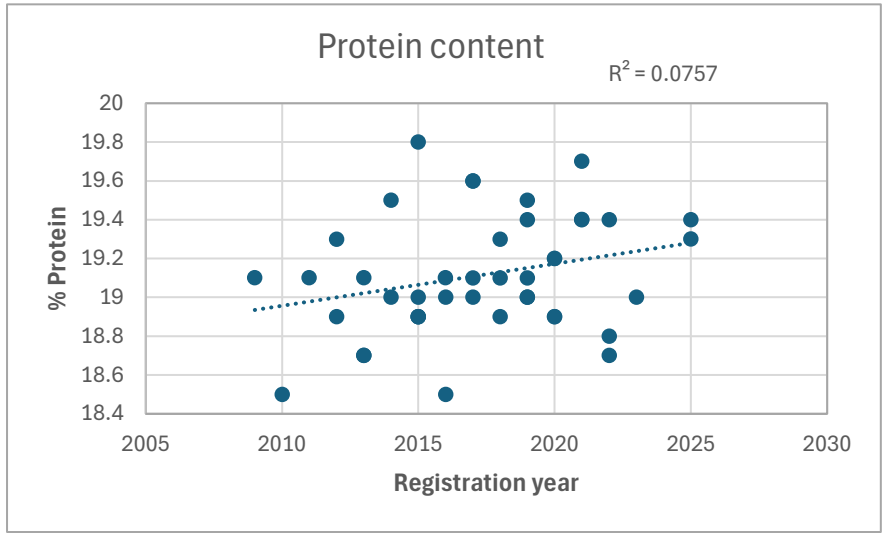
INRAE la science pour la vie, l'humain, la terre
French agronomics institute

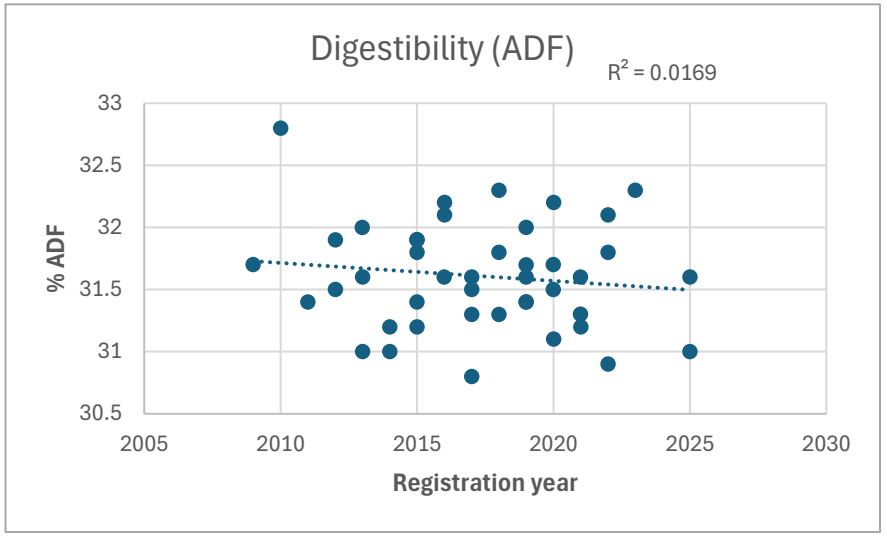
LA COOPÉRATION AGRICOLE LUZERNE DE FRANCE
French alfalfa dehydration companies

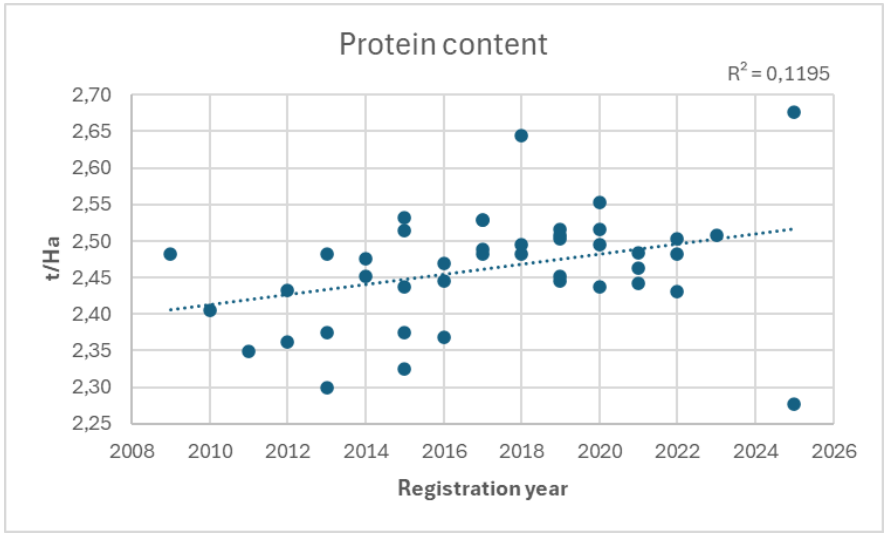
GEVES Expertise & Performance
French Study and Control Group for Varieties and Seeds

Feed quality evolution In the French varieties

Herbe-Book data (https://herbe-book.org/)







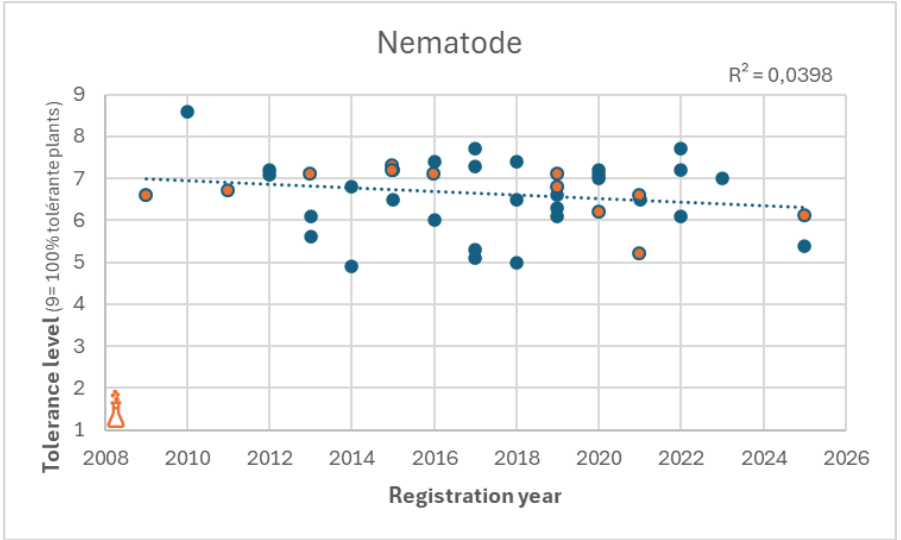
➔ **Increased protein content and digestibility**

Nematode tolerance evolution In the French varieties

Herbe-Book data

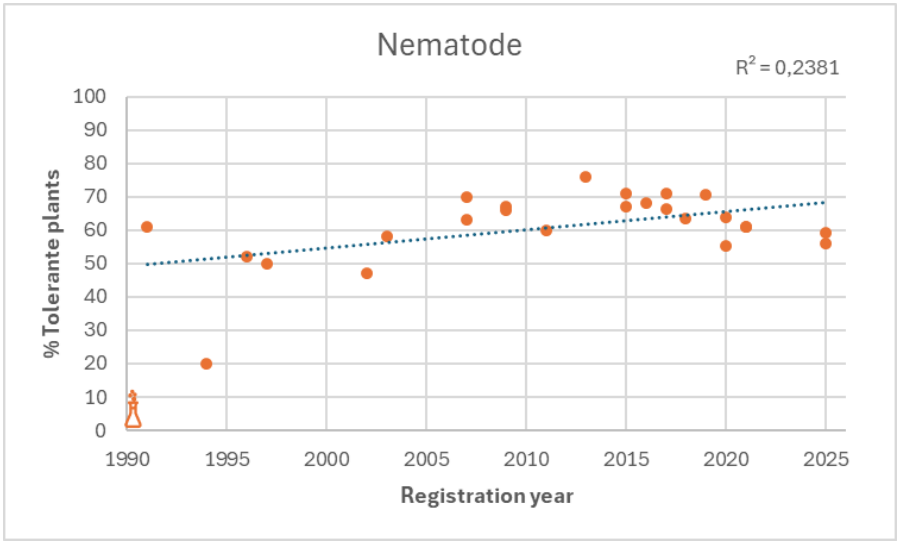
(https://herbe-book.org/)

- Period: 2009-2025
- Controlled conditions tests



GIE GRASS data

- Period: 1991-2025
- Controlled conditions tests



-> Increase in tolerance to nematodes over the past 30 years

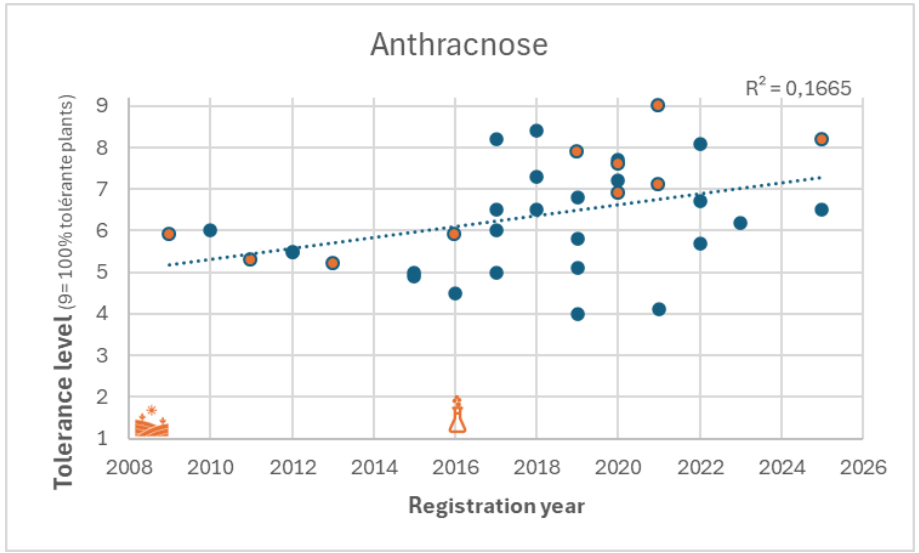
Anthracnose tolerance evolution In the French varieties

Herbe-Book data

(https://herbe-book.org/)

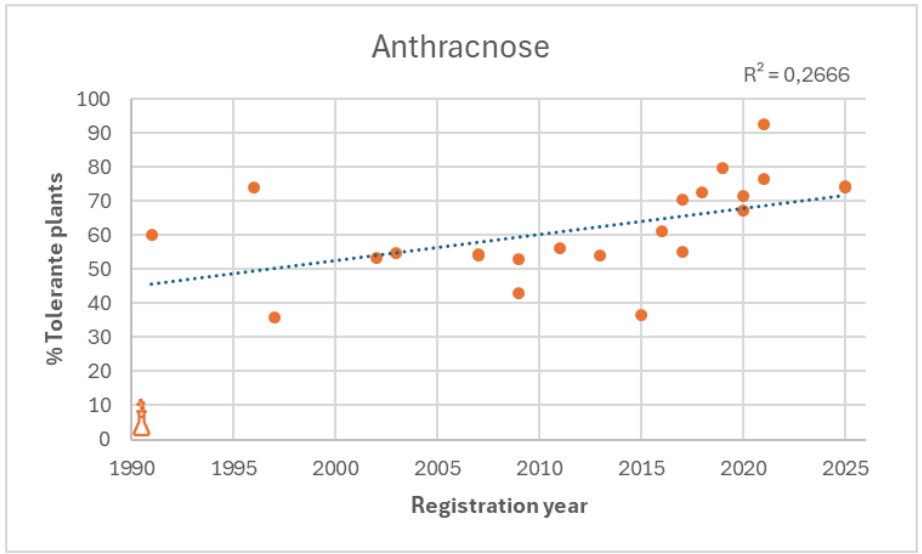
- Period: 2009-2025
- Visual field ratings

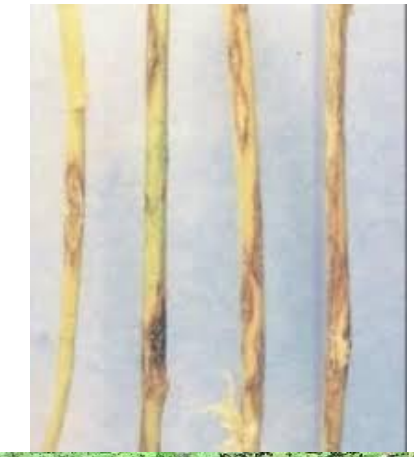
2016 controlled conditions tests

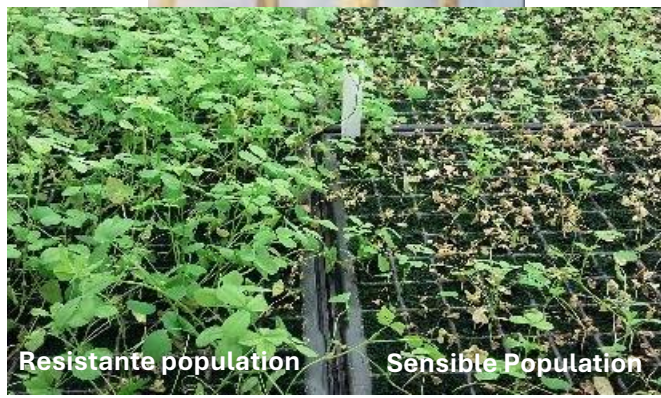


GRASS data

- Period: 1991-2025
- Only controlled conditions tests







-> Increased tolerance to anthracnose

Conclusions

Effective selection combined with a rigorous recording system has led to genetic progress in alfalfa.

-> **Increased total yield**

Increased yields from first cut and spring cuts

No improve in fall yield

-> **Increased protein content and digestibility**

despite the negative correlation between yield and feed quality

-> **Increased tolerance to anthracnose and nematode**