

# Key figures for pastures and rangelands

ASSETS AND CHARACTERISTICS OF THE PASTURES AND RANGELANDS IN FRANCE,  
AT THE VERY HEART OF THE COUNTRYSIDE AND ON THE MENU FOR RUMINANTS



## “Pastures and rangelands: rediscovering their riches”

**P**astures and rangelands have numerous advantages: they help sustain our countryside, preserve biodiversity, store carbon, fight climate change, enhance our land, and, of course, provide sustainable food for our herbivores and milk and meat, which is both healthy and meets citizen expectations.

Grass is a key element of ruminant livestock rearing systems, as well as being the most obvious and natural food resource for cattle, sheep and goats. It is also the most economical food resource to produce, in terms of mechanization and input costs. And it has excellent nutritional advantages!

Both pastures and rangelands harbour unsuspected riches. In order to highlight this wealth, the French Livestock Institute, the RMT Avenirs Prairies, Cap Protéines and the UMT Pasto have put together some key figures in this collection.



CAP PROTÉINES  
PROGRAMME  
FINANÇÉ PAR



MINISTÈRE  
DE L'AGRICULTURE  
ET DE L'ALIMENTATION  
*Liberté  
Égalité  
Fraternité*

The ministries in charge of agriculture and the economy  
cannot be held responsible

## PASTURES AND RANGELANDS IN FRANCE

**11.5 million ha** of pastures  
and **2.2 million ha** of rangelands  
to feed **2.7 million** ruminants

**11%**  
of permanent grassland is **organic**

**160 running metres** of hedges  
per hectare of pasture

**78%** of grass in dairy cattle rations

**55 million tonnes**  
of grass dry matter

**58%** of it used for grazing

and **42%** of it used in hay, silage  
or wrapping

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# Pastures and rangelands

## What exactly are they?



### Pastures

**Pastures, which feature across the entire French territory, are agricultural areas made up of herbaceous vegetation, mainly grasses and legumes, intended for animals.**

Pastures are categorised into two types. **Natural or permanent pastures** are pastures that have been sown for over six years. Their vegetation is often highly diverse.

**Temporary pastures** are pastures that have existed for less than six years. They are composed of mixes of more or less complex species. Pastures are grazed on by herds and can also be cut to produce stocks of fodder in the form of hay, silage or wrapping.



### Rangelands

**Rangelands are non-seeded areas of herbaceous, bushy or wooded vegetation that are not easily, or not at all, machine harvestable.**

These high-altitude grasses, heathlands, brushwood or scrublands are found in environments of harsh pedoclimatic conditions, such as rugged topography, surface soils or poor soils, and harsh climatic conditions (such as strong sun exposure and water scarcity) with only short vegetal growth periods.

They produce little consumable biomass. They are used mainly for grazing by herds. In order to meet the animals' needs, large areas are necessary.



PASTURES AND RANGELANDS:  
THE VERY HEART  
OF THE COUNTRYSIDE

## With pastures and rangelands, our blue planet is also green!

Pastures and rangelands make up nearly a third of the world's total land area.  
They form a tapestry of landscapes used by grazing livestock.

**31%**  
of the planet's  
land areas are  
covered by  
prairies  
and bushy  
heathland



MAKING THEM  
THE MOST WIDESPREAD  
TYPE OF HABITAT  
ON EARTH (FAO 2014)

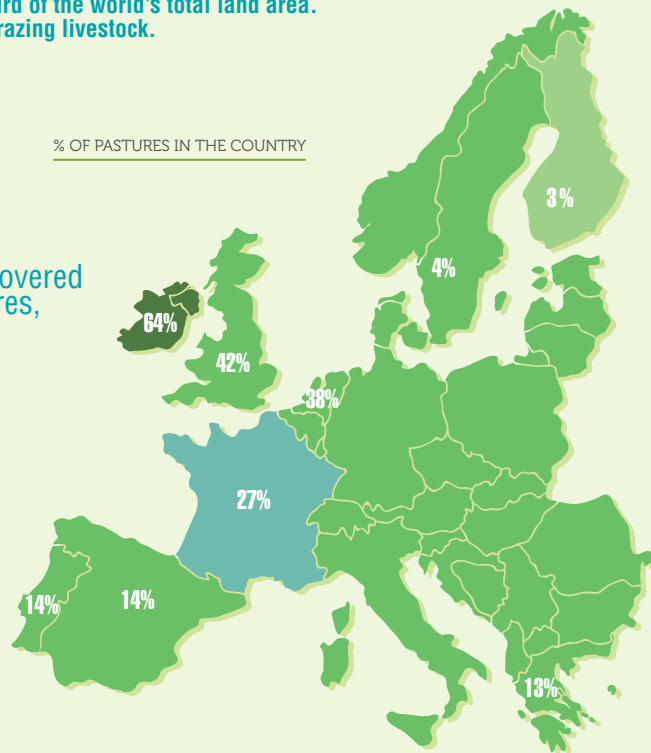
In the European  
Union,

**30%** of European  
agricultural land is covered  
by permanent pastures,

**5%** by temporary  
pastures  
(de Vliegther et van Gils, 2010)

In Europe,  
**over  
30 million ha**  
of rangelands  
(FAO, 2021)

% OF PASTURES IN THE COUNTRY



(de Vliegther et van Gils, 2010)



## France, a land of livestock rearing, featuring a tapestry of pastures

**20%**  
of the national  
surface area  
is covered by pastures,  
spanning  
**11.5**  
million hectares

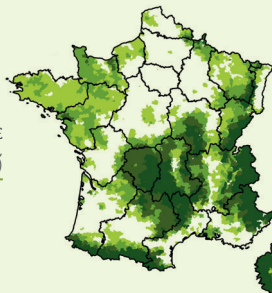


Cattle, sheep, goats, equidae...  
No pastures without herbivores

### PASTURES FEATURE WIDELY IN LIVESTOCK REARING AREAS AND PARTICULARLY IN MOUNTAIN RANGES

(2010 AGRICULTURAL CENSUS, TREATMENT IDELE)

PERCENTAGE  
OF PASTURES IN THE UAA,  
IN 2010 (BY CANTON)

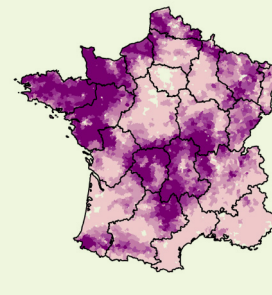


**27** million ruminants, made up of  
**14.6** million LSU  
and **1** million equidae  
make the most of French pastures

### THE MAPS OF FRANCE OF HERBIVORES AND PRAIRIES OVERLAP PERFECTLY

(2010 AGRICULTURAL SURVEY, TREATMENT IDELE)

NUMBER  
OF HERBIVORE LSU  
PER KM<sup>2</sup>, IN 2010

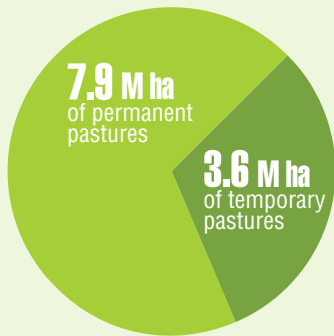




PASTURES AND RANGELANDS:  
THE VERY HEART  
OF THE COUNTRYSIDE

Permanent pastures are either natural or were seeded more than 6 years ago

Among them, 18% are permanent grass surfaces with low productivity, similar to pastures



SHARE OF PERMANENT AND TEMPORARY PASTURES IN 2010



Temporary pastures are seeded for a maximum duration of 6 years

Among them, 92% are covered by one or several species of grasses, with or without legumes  
8% are covered solely by one species of legume (such as alfalfa or red clover, etc.). These are referred to as artificial pastures

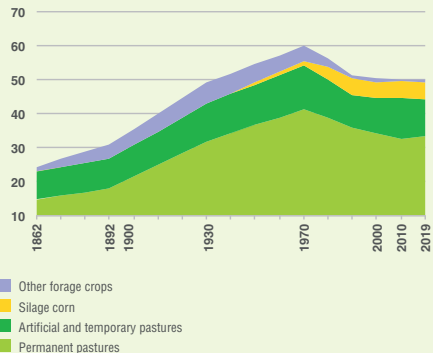
In France, 41% of Utilised Agricultural Land is made up of pastures

AFTER PEAKING IN 1970, TOTAL SURFACE AREA OF PASTURES HAS NOW STABILISED FOR 30 YEARS

EVOLUTION OF THE SHARE OF FORAGE AREAS IN FRANCE OVER 160 YEARS

Before the 20<sup>th</sup> century, grass was thought to compete with cereal. Cattle would feed on rough grazing and fallow land.

Percentage of Utilised Agricultural Land

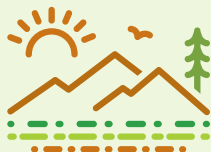


(ten-year agricultural censuses (1862-2000), Agreste SSA (2010), treatment IDELE)



**PASTURES AND RANGELANDS:  
THE VERY HEART  
OF THE COUNTRYSIDE**

## Synergy of livestock rearing and rangelands in Mediterranean and mountainous areas

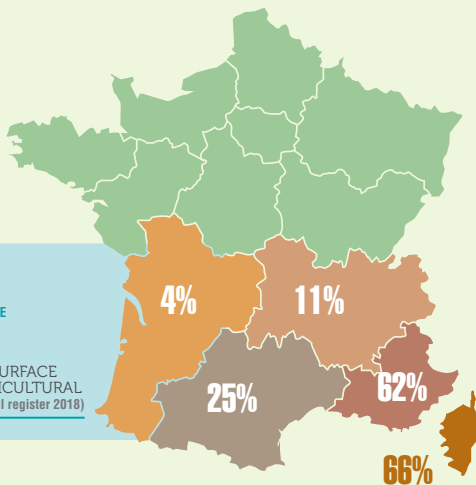
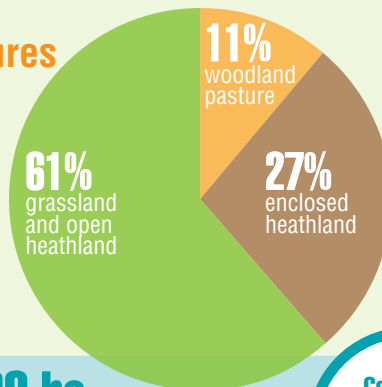


**Grassland, heathland and wood pastures  
make up rangelands.**

They represent **at least 5%**  
**of the national surface area,**

which **is over 2.2 M** hectares

(Land parcel register 2019)



**RANGELANDS ARE MAINLY  
FOUND IN UPLANDS  
AND THE MEDITERRANEAN ZONE**

**SHARE OF PASTORAL SURFACE  
AREA IN UTILISED AGRICULTURAL  
LAND IN 2018 (Land parcel register 2018)**

**750.000 ha**  
of these rangelands are managed  
by **1.400** collective entities  
**1050** of these are pastoral units

The land belongs **to over 33.000** owners

grouped into **350** Pastoral Land Associations

(AgropastoM, 2018, according to AFP 2011 and DDT 2016)

**Collective  
management,  
a specificity  
of pastoral  
farming**





PASTURES AND RANGELANDS:  
THE VERY HEART  
OF THE COUNTRYSIDE

## Sheep, goats, cattle

**1.5 M LU** make up the livestock population  
of extensive pastoral farms\* that use French rangelands

**35.000**  
Extensive-pastoral-style farms\*

rear **11%**  
of French herbivore livestock  
population made up of:

**43%** milk sheep

**36%** meat sheep

**36%** equidae

**15%** goats

**10%** beef cattle

**5%** dairy cattle



**18%** of French  
grazing livestock  
use rangelands



amongst them, **90%**  
of meat sheep farms  
with over 150 ewes  
of the Paca and  
Former-Languedoc-  
Roussillon regions

**\*meaning farms that:**

- use collective pastureland
- OR with a density of less than 0.7 LU per ha of main forage area
- OR with an unproductive permanent grassland surface area greater than 10 ha AND representing over 50% of the main forage area AND having a density of less than 1.4 LU per hectare of main forage area.



THE MANY GREEN  
ASSETS OF PASTURES  
AND RANGELANDS

## Pastures and rangelands are reservoirs of biodiversity

Pastures and rangelands are home to a rich and diverse flora and fauna.  
This biodiversity is found in equal measure above and below the soil.

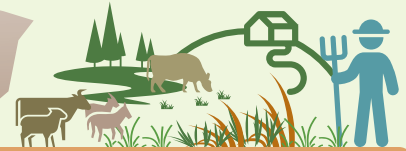
**58%** of French **Natura 2000** surfaces are covered by **agro-pastoral habitats (hay meadows, pastureland, mountain pastures and heathland)** recognized as being sites of high environmental value, due to the exceptional fauna and flora that they shelter  
(Lavaud, 2017)



**32** is the average number of different vegetal species in a permanent pasture

This figure can reach up to

**100** species in highly diversified pastures  
(e-FLORA-sys, 2020)



**75** categories of pastoral habitat have been identified in the South-East of France

THE **CEVENNES NATIONAL PARK** ALONE IS HOME TO OVER **2.400 ANIMAL SPECIES** AND **11.000 VEGETAL SPECIES**  
(National Parks of France, 2012)



THE MANY GREEN  
ASSETS OF PASTURES  
AND RANGELANDS



**88% OF BUTTERFLY  
SPECIES ARE  
DEPENDENT  
ON NATURAL  
PASTURES**

On average, **160** running metres of hedges  
are maintained for **1 ha** of permanent pasture  
compared to **56 m** for **1 ha** of cropland



Beneath **1 ha** of pasture, between **150** and **300** earth worms per m<sup>2</sup>


**20 TIMES MORE  
EARTH WORMS  
IN A PASTURE  
THAN IN  
PLOUGHED  
LAND**

**4.5 t** of fauna,  
**1.1 t** of which are  
earth worms



which is  
**equivalent  
to the weight  
of 6 cows**

**OVER 45%  
OF MICROBIAL  
BIOMASS  
BENEATH  
A PASTURE  
COMPARED  
TO A PLOT  
OF PLOUGHED CROP**



(Chiffres clés de l'environnement, 2018 – L'élevage de ruminant, acteur de la biodiversité – Idele, 2016 – Hirissou, 2012, Rieutort et al. 2014 – GIS Sol – Van Swaay et al. 2006).



## Not requiring many inputs, pastures are at the centre of a virtuous circle

Recycling nitrogen and needing less phytosanitary treatment than crops, pastures are as green as they are great.

**120 to 300 kg** of atmospheric nitrogen per hectare per year  
fixed by the pastures rich in legumes

**HALF AS MUCH NITROGEN  
POTENTIALLY LOST  
IN THE WATER  
OR AIR...**

**Less risk  
of leaching  
in a pasture  
thanks to the absence  
of bare soil and to the  
organisation of nitrogen  
in the soil**

**A pasture is balanced and self-sufficient  
in nitrogen when the % of legumes  
is 20% at the start of spring  
and 50% at the end of spring**

The quantity of mineral nitrogen left after a pasture  
for a crop varies between 20 and 120 kg  
of nitrogen per hectare (Comifer 2011)

**... for open field  
dairy cattle farms  
with a lot of grass  
and little corn (10% of the main  
forage area)  
compared to the farms  
with over 30% of corn**  
(Foray et al, 2013, according to Inosys)





THE MANY GREEN ASSETS OF PASTURES AND RANGELANDS

**12** TIMES FEWER PHYTO\* TREATMENTS IN TEMPORARY GRASS-LEGUME PASTURES

THAN IN CORN SILAGE



**95%** OF PASTURES RECEIVE NO HERBICIDE TREATMENT

**98%** OF SEEDS USED ARE NON-TREATED

(DePHY Fermes Ecophyto 2009-2011, Agreste 2017, SSP)



A rotation introducing 6 years of temporary pastures compared to a rotation not introducing any = **25 to 50%** fewer weeds

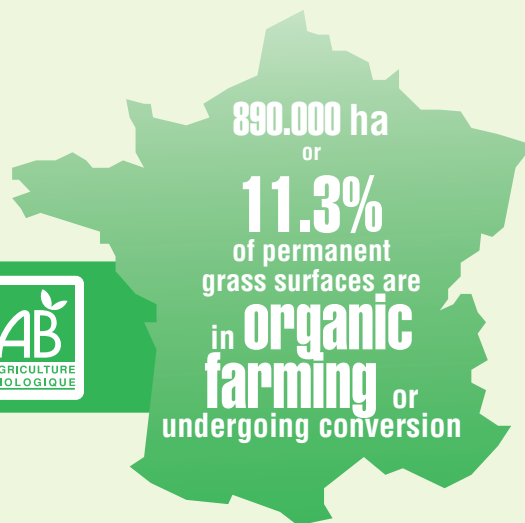
(Schuester et al. 2019)

limits the use of herbicides



\*Treatment frequency index (TFI)

(Agence Bio, 2020)



890.000 ha

or

**11.3%**

of permanent grass surfaces are

in **organic farming** or

undergoing conversion

Less erosion in pastures:

(Cerdan et al. 2010)

Loss of soil under a pasture:

**0.3 t/ha/year**

Loss of soil under an annual crop:

**3.6 t/ha/year**



THE MANY GREEN ASSETS OF PASTURES AND RANGELANDS

## Pastureland: an asset for the climate

Pastures and rangelands are veritable carbon wells. Grass captures the carbon from the air via photosynthesis and stores it in the soil in the form of organic carbon.

### MORE CARBON STORED UNDER A PASTURE THAN UNDER A FOREST!

AVERAGE AMOUNT OF CARBON STORED IN THE FIRST 30 CENTIMETRES OF SOIL, IN TONNES OF CARBON PER HECTARE



**85 t C/ha**

UNDER PERMANENT PASTURES



**81 t C/ha**

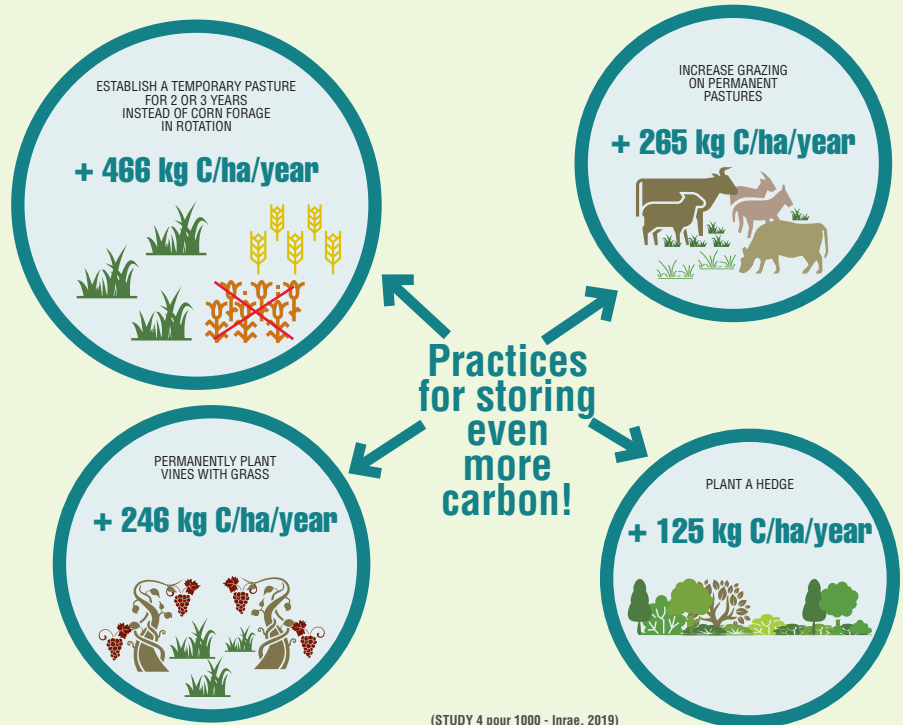
UNDER THE FOREST



**52 t C/ha**



UNDER FIELD CROPS

(Stats RMQS Gis sol)



(STUDY 4 pour 1000 - Inrae, 2019)

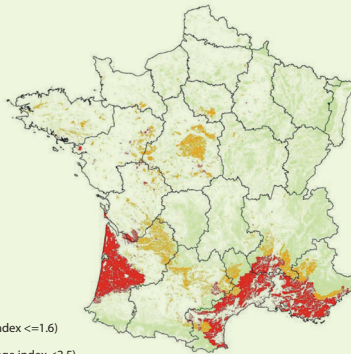
THE MANY GREEN ASSETS OF PASTURES AND RANGELANDS

   
**+1.7°C**  
**ON AVERAGE**  
**IN FRANCE SINCE 1900**  
(Météo France, 2020)






SENSITIVITY TO SUMMER FOREST FIRES IN 2040 OF FORESTS OVER 100 HA

By 2060, the fire conditions of summer 2003 will occur 1 in every 2 years in the south of France

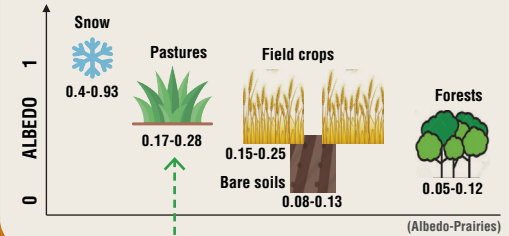


(CGEDD, 2010)

-  1 (average index <=1.6)
-  2 (1,6 < average index <2.5)
-  3 (average index >= 2.5)

### SOIL ALBEDO

The albedo is the fraction of solar energy that is reflected into space. It has a value of between 0 and 1. The more reflective a surface, the higher its albedo.



**All year round, pastures reflect more light** than bare soils or forests because they are lighter. This solar energy reflecting into space heats up the atmosphere less. **Given their high albedo, pastures help keep climate change in check.**

**Pastoralism** is an ecological and economic way to create fuelbreaks and to fight fires



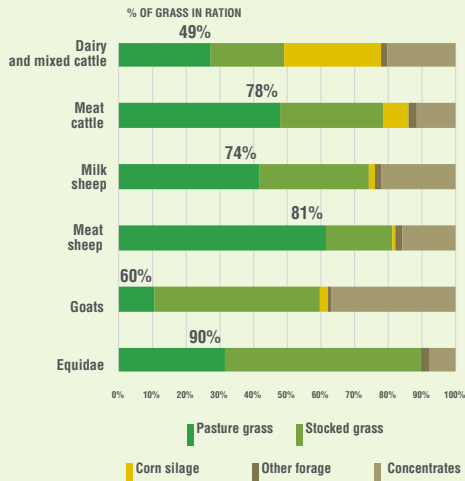
PASTURES AND RANGELANDS  
ON THE MENU FOR RUMINANTS

## Pastures and rangelands as essential ruminant food

Ruminants consume mainly grass, a form of vegetation that is non-recoverable by humans. In pastoral areas, rangelands provide on average half of all animal rations.

### HERBIVORES EAT MAINLY GRASS!

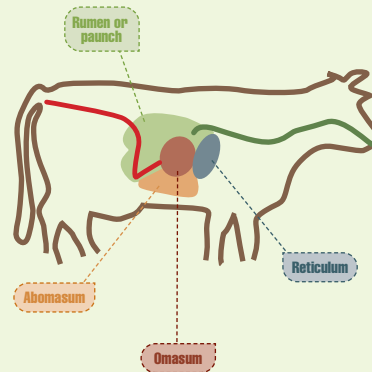
AVERAGE COMPOSITION OF HERBIVORE RATION  
IN FRANCE (Cordier et al. 2020)



Ruminants are able to make good use of vegetation that is not consumable by humans

FOUR STOMACHS TO DIGEST GRASS

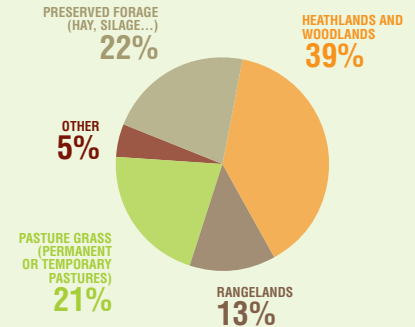
6 to 9 hours daily of rumination  
among cattle and sheep



For the farms documented in StratPasto (pastoralism advisory tool), the percentage of **pastoralism**, in other words, the share of total dry matter ingested on **rangelands, heathlands and woodlands**, is on average

# 52%

COMPOSITION OF DRY MATTER INGESTED  
BY HERDS MONITORED BY STRATPASTO





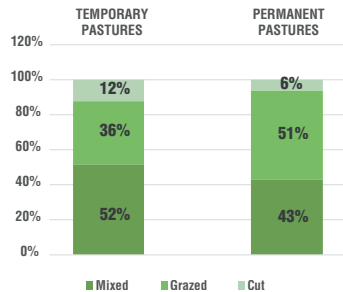


PASTURES AND RANGELANDS  
ON THE MENU FOR RUMINANTS

### COMBINING CUTTING AND GRAZING TO MAKE THE MOST OF GRASS IN ALL ITS FORMS

**52%** of temporary pastures and **42%** of permanent pastures are both cut and grazed

MODE OF EXPLOITATION OF PASTURES  
(SHARE OF SURFACE AREA, IN %)



(SSP, 2017)

Every year, French livestock farmers make the most of:

**55** million tonnes of grass dry matter

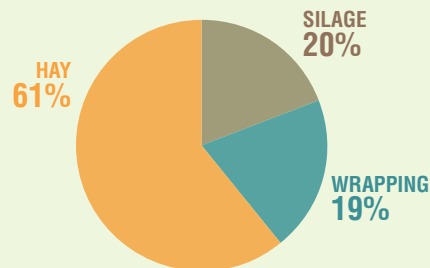
**58%** grazed directly by ruminants



**42%** harvested to be stored in the form of hay, silage or wrapping



THE THREE PRINCIPAL METHODS OF STORING GRASS (INOSYS 2014-2018)



Between 2008 and 2018, THE % OF SURFACE AREAS HARVESTED IN WRAPPING INCREASED BY:

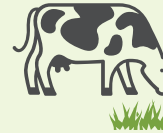
**+ 89%** for first cutting  
**+ 117%** for second cutting

(INOSYS 2014-2018)



PASTURES AND RANGELANDS  
ON THE MENU FOR RUMINANTS

## The art of grazing



**91%**  
of dairy **cattle farms**  
practice **grazing**  
(Res'alim 2018)

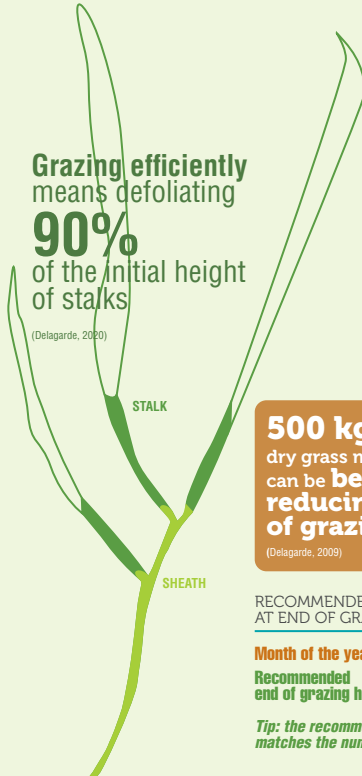
**93%**  
of sheep farms  
practice **grazing**  
(RA, 2010)

**30.000**  
is the average number  
of daily mouthfuls  
of one grazing cow

**50**  
is the average number  
of mouthfuls per minute  
of an adult ewe (Delagarde et al. 2001)

Grazing efficiently  
means defoliating  
**90%**  
of the initial height  
of stalks

(Delagarde, 2000)



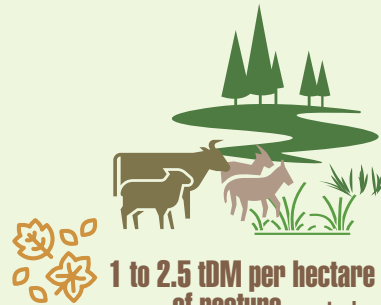
**500 kg** of supplementary  
dry grass matter per hectare  
can be **better exploited** by  
**reducing the height at end  
of grazing by 1 cm**

(Delagarde, 2009)

RECOMMENDED HEIGHT OF GRASS  
AT END OF GRAZING (Delagarde, 2020)

Month of the year	March	April	May	June
Recommended end of grazing height	3 cm	4 cm	5 cm	6 cm

*Tip: the recommended end of grazing height  
matches the number of the month!*



**ADVISED  
DURATION OF REST  
BETWEEN TWO  
GRAZINGS:**

**1 to 2.5 tDM per hectare  
of pasture** are to be  
exploited in the autumn,  
and often more simply  
by grazing than by cutting

**20-30 days in spring**  
**60-70 days in summer**  
**40-50 days in autumn**  
**50-60 days in winter**



PASTURES AND RANGELANDS  
ON THE MENU FOR RUMINANTS

## Pastures, a manual

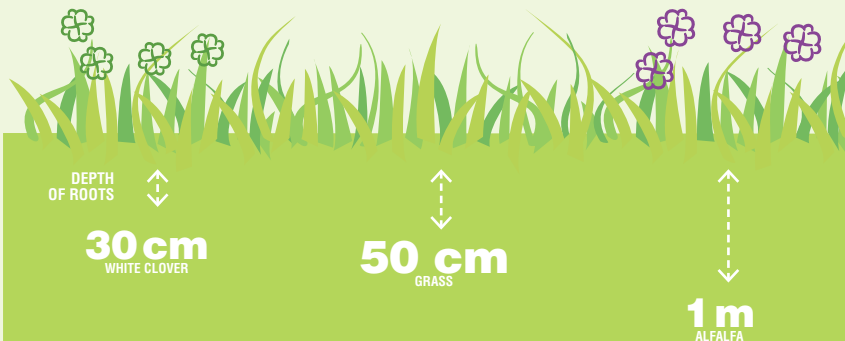
The plants making up pastures need water, nutrients, heat and light to grow.

### 100°C days

is the sum of daily temperatures that white clover needs to form a new leaf  
(Le guide de l'herbe, 2005)

### 5 to 6

is the number of tillers that a grass can produce per year  
(Le guide de l'herbe, 2005)



ON DEEP SOIL,  
**alfalfa** draws 20 to 50 mm more water than orchard grass,  
which explains its greater resistance to drought

(Duru et al 2010)



## 43%

of grass surfaces receive at least one mineral nitrogen input every year

This fertilisation is provided in one go for 90% of surface areas

## 96%

of organic manure spread on pastures comes from the herd that consumes them

(SSP, 2020)



PASTURES AND RANGELANDS  
ON THE MENU FOR RUMINANTS

## Pastures to sow and compose

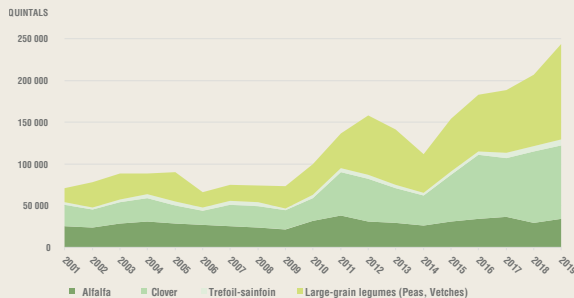
The varietal composition of pastures tends to become more complex with increased mixes of seeds.



6  
out of 10  
is the figure of  
temporary  
pastures aged  
over 3 years  
(SSP, 2020)

OVER 20 YEARS,  
an increase of **157%**  
in sales of small-grain  
legume seeds

EVOLUTION OF SALES OF PASTURE LEGUMES (IN QUINTALS)



**83%**  
of permanent pastures  
have never been seeded  
(SSP, 2020)



MULTI-SPECIES PASTURES  
ARE INCREASINGLY BEING  
PLANTED IN FRANCE. THEY  
HAVE MANY ADVANTAGES

more ingestible  
more proteins  
more yield consistency



**91%**  
of temporary pastures  
are seeded in mixes

Between  
**+0.9 and +1.9 tDM/ha**  
is the average supplementary yield  
of a multi-species pasture compared  
to a pasture of ryegrass and white clover  
(Coutard et al, 2012)

**37%** of seeds  
for pastures were sold in a mix  
in 2017/2018 (compared to 7% in  
2004/2005)

(Semae 2020)



PASTURES AND RANGELANDS  
ON THE MENU FOR RUMINANTS

## The climate is changing, grass management too

With climate change, distribution throughout the year of grass growth is evolving.



IN SPRING,  
**16 days saved**  
on average on  
grazing by 2100  
compared to 1976-2005  
(Climait)



IN A SCENARIO WITH NO CLIMATE POLICY,  
the increase in summer temperatures  
could **exceed 5°C**  
by 2071-2100 (Climat HD, MF)

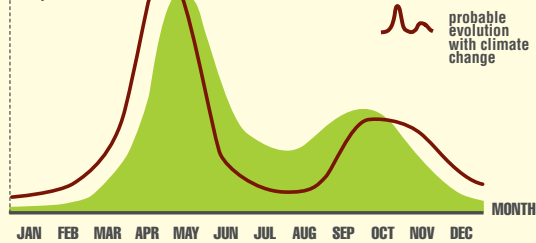
**IN SPRING,**  
more grass, quicker, earlier

**IN SUMMER,**  
hotter and a more pronounced  
drop in production

**IN AUTUMN AND WINTER,**  
new opportunities

GRASS GROWTH CURVE

Production in biomass  
of a pasture



At **25°C**

**ryegrass  
stops  
growing**  
(Duru et al., 2010)



**Alfalfa reaches  
its optimal  
growth at**

**29°C**  
(Zaka, 2016)



PASTURES AND RANGELANDS  
ON THE MENU FOR RUMINANTS

## Grass, the economic lever of herbivore farms

Pasture grass is rich in energy and proteins, and cheap to produce, especially when herbivores are left to graze on it.



Pastures **limit dependence on proteins**

**over 60% of proteins used per ha compared to corn**

(Delagarde, 2020)



**8 FEWER WORKING HOURS PER WEEK WITH A GRAZING DAIRY-CATTLE HERD COMPARED TO INDOOR HERD MANAGEMENT**

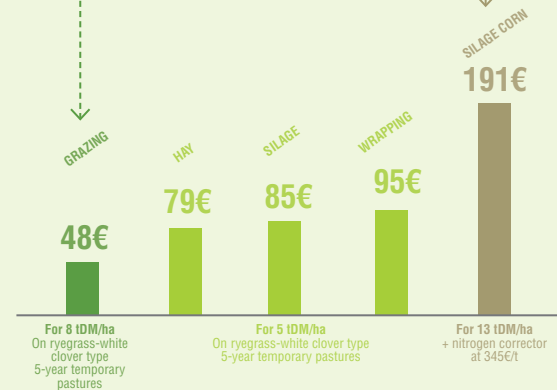
and less demanding and seasonal work...

(ETRE-EDE dairy network and Brittany Chambers of Agriculture)

Grazing by dairy cattle is **4 times cheaper**



than silage corn per tonne of balanced dry matter



## Booklet created by the French Livestock Institute

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## Key figures for pastures and rangelands

**In France**, 11.5 million hectares of pastures and about 2.2 million hectares of rangelands feed 27 million ruminants. These grassland areas produce 55 million tonnes of grass dry matter which are grazed on for 58% and cut for 42% to be stored in the form of hay, silage or wrapping.

In addition to being the main source of food for ruminants in France, these pastures and rangelands possess many green assets, as outlined in this booklet. An original and entertaining way to find out more about pastures and rangelands.



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**MINISTÈRE  
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The ministries in charge of agriculture and the economy  
cannot be held responsible

