ISOP V10
Update of the Information et de Suivi Objectif des Prairies INRAE - Météo-France – SSP MASA.

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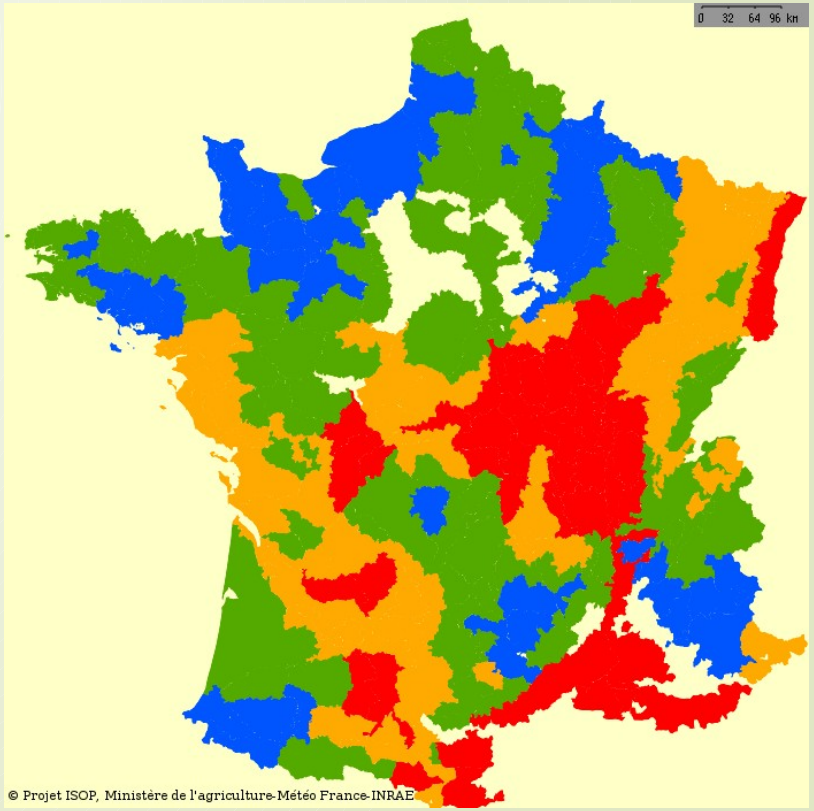
plan

- What is ISOP ?
- State in 2020 ?
- Modifications
- Feedbacks and perspectives ?



What is ISOP ?

- A request from the Ministère de l’Agriculture

- spatialised at *Forage Regions* scale

- based on climate, soil and management variables

- production of simulations by STICS.

What is ISOP ?

- For each forage region (FR), the index is the ratio between cumulated harvestable forage production and the 30 year mean (sur 1989-2018).

- Meteo France operates the daily simulations every month and produces a report (files of yields and 6 other variables and maps)

- Soils traits provided by INRA based on the 1/ 10^6 French soils map

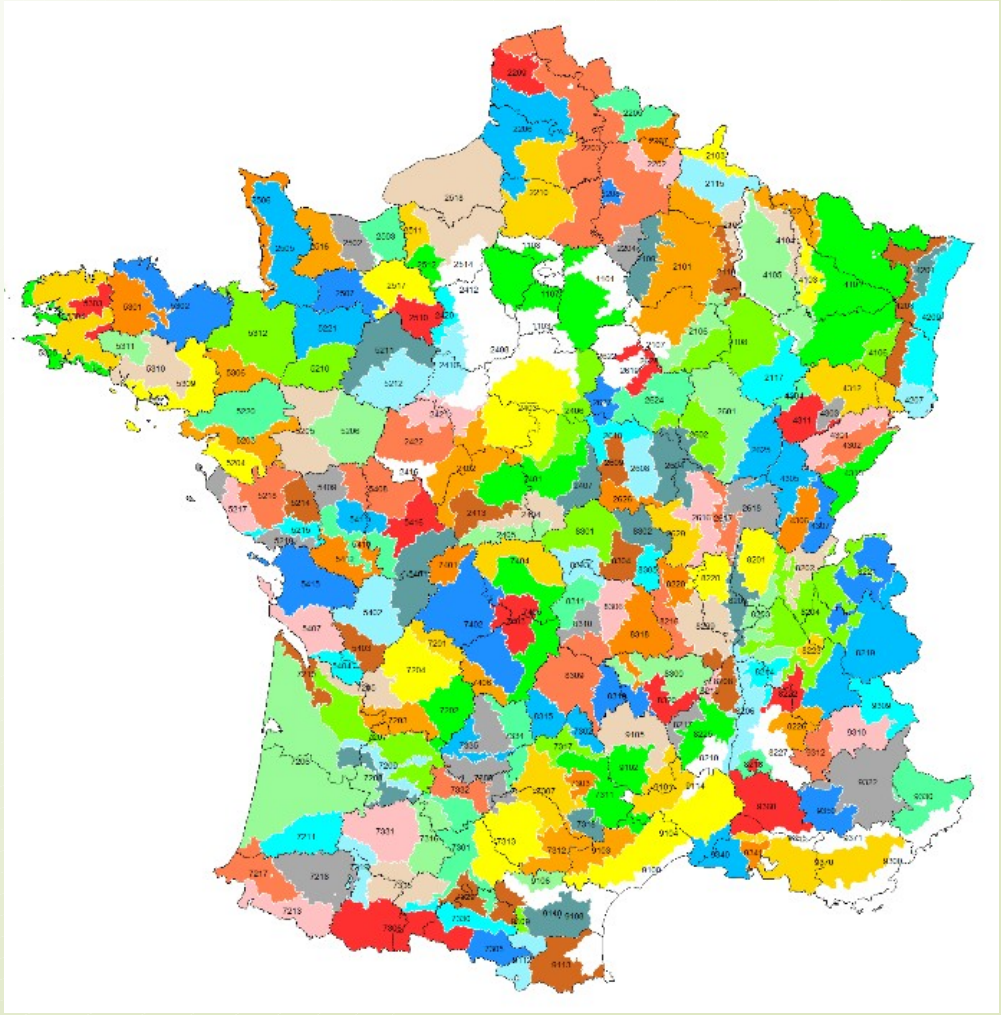
- Management types from a National survey made by the Ministère de l'Agriculture

- The STICS prairie version was made by INRA, based on a standard grass species specification.

What is ISOP ?

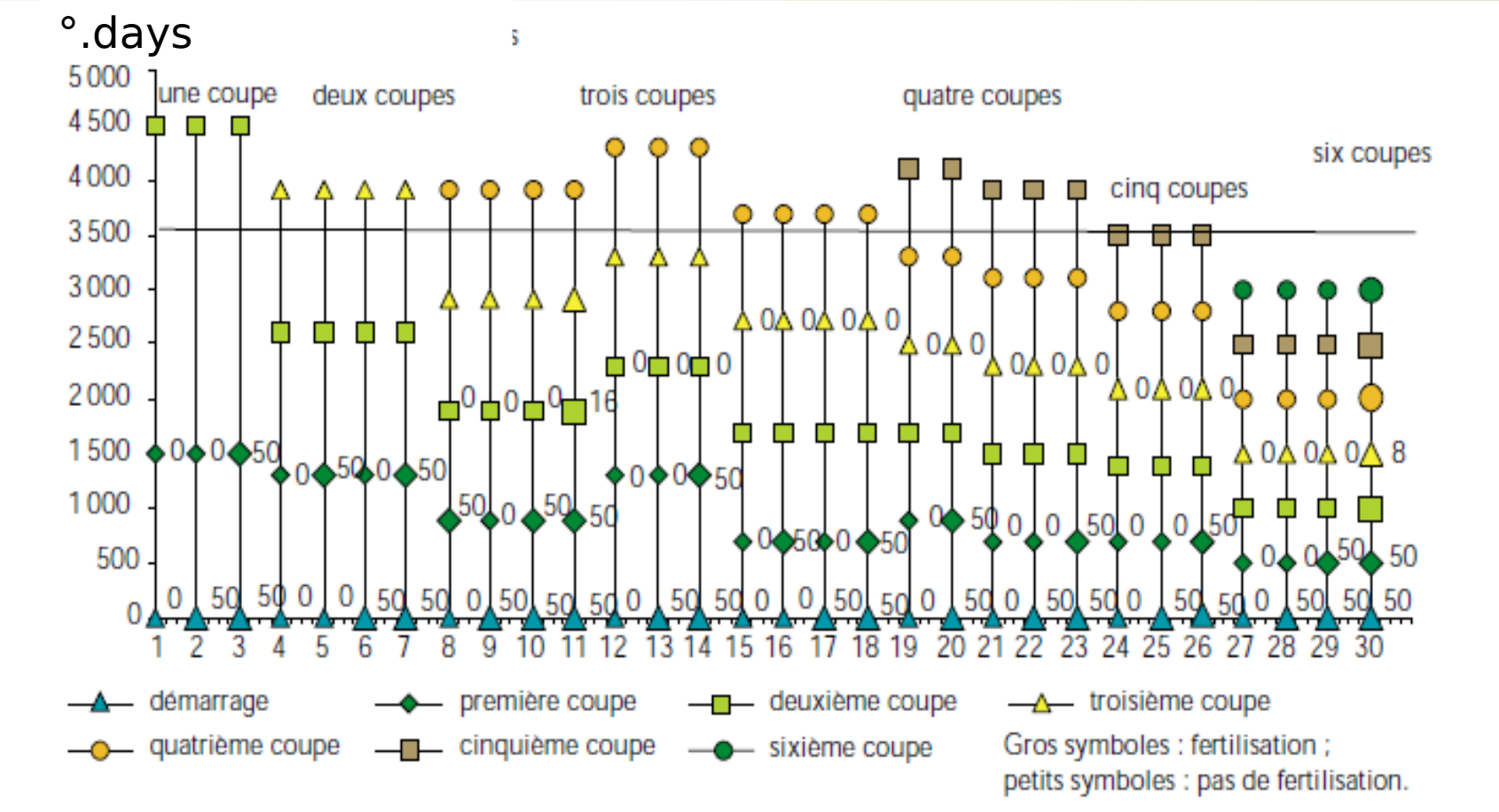
The Forage Regions

(Hentgen 1982)



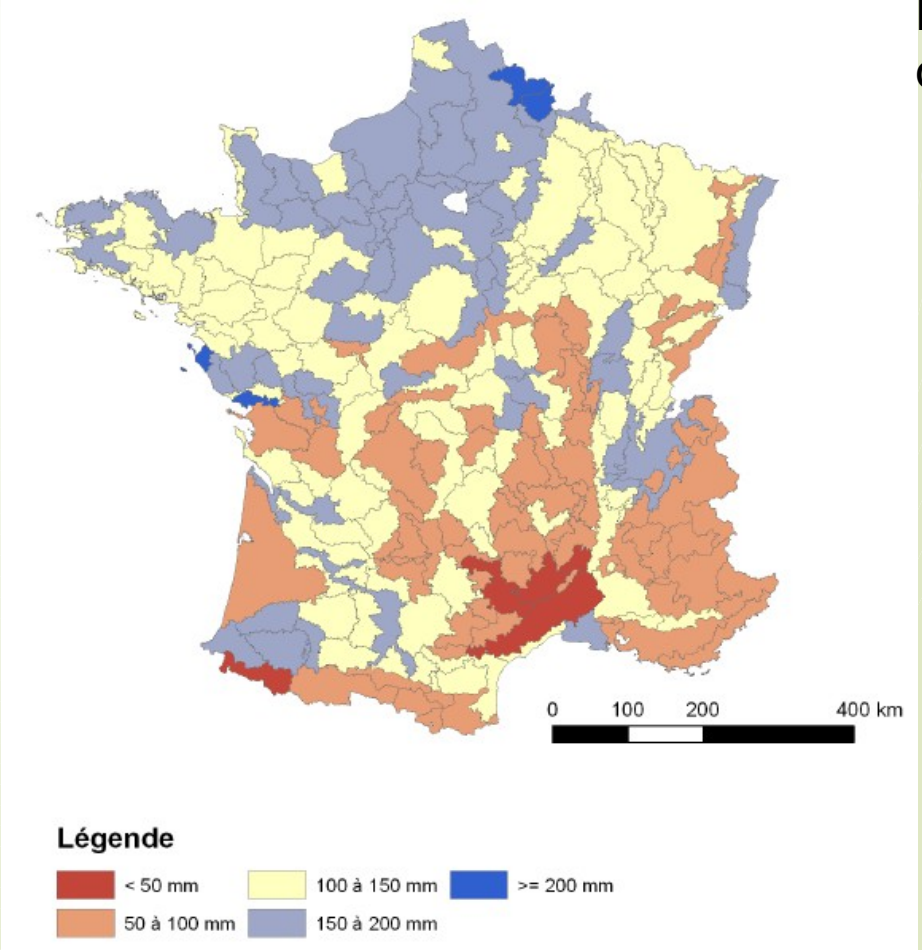
What is ISOP ?

Management (harvest (frequecy) and N Fert)



What is ISOP ?

Field capacity map



Réserve Utile moynne des régions fourragères d'après la base de données géographique des sols de France à 1/ 1 000 000.

Version 3.2.8.0 du 10/09/1998. (Unité infosol, INRAE) Source : version 3.2.8.0 10/9/1 998. INFOSOL INRAE.

What is ISOP ?

- For each region, most frequent soils (max 5) and most frequent managements combined factorially, ie 25 situations considered in each FR.

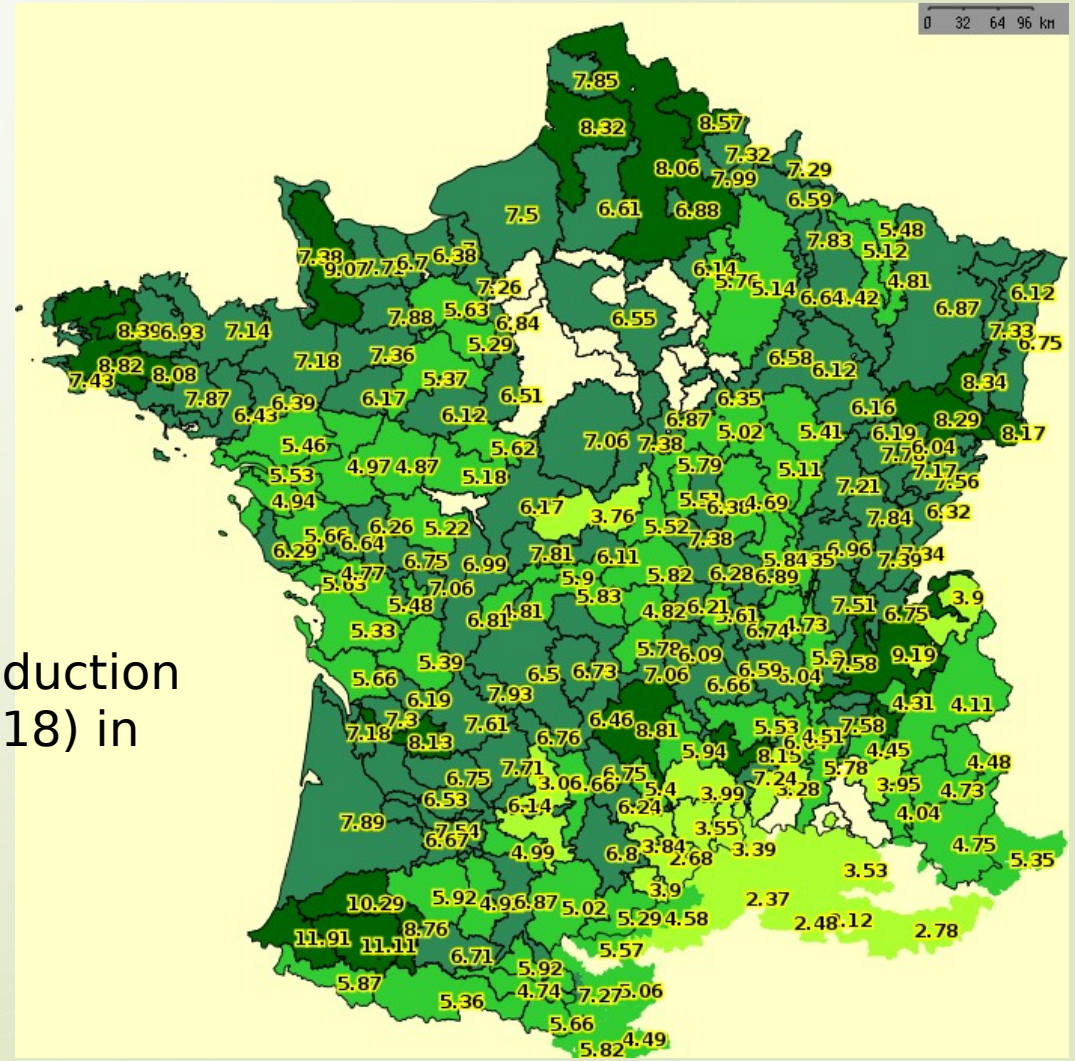
- Daily values for climate are averaged at the FR scale, from the Meteo France grid (0.125 ° 14 km appr.)

- The FR production is the mean of the 25 simultations, weighted according to surface area of each management practice

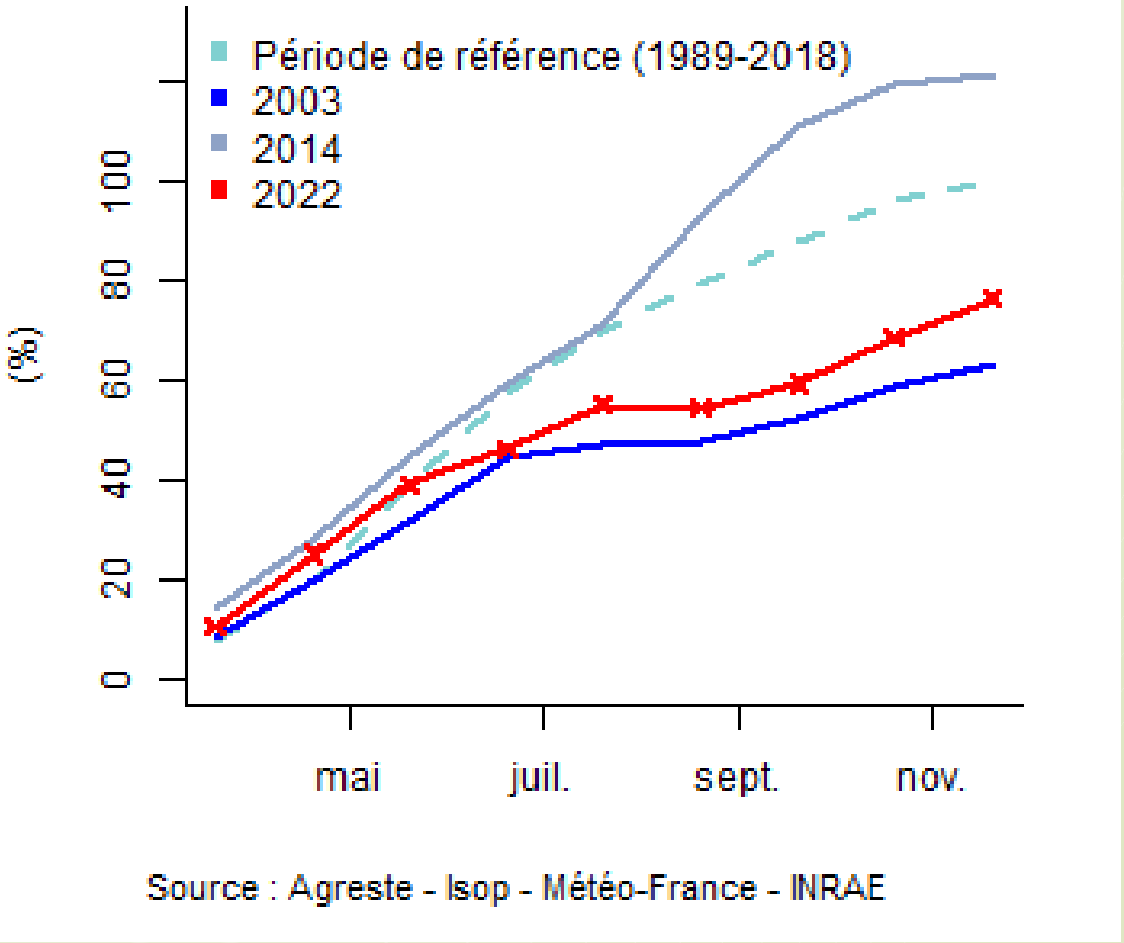
- Index = ratio of that averaged cumulated production over the 1989-2018 mean.

What is ISOP ?

Annual weighted production mean (T/Ha 1989-2018) in each FR



What is ISOP ?



Cumulated production with time as a percentage of the mean. 100 = mean of 1989-2018 on November 30

- Situation in 2020 ?

Situation in 2020 ?

Errors detectd by operators (F Ruget et al.) or alerts from regions in France, which indicated mismatch between the simulations and observations or a misunderstanding of the simulations.

Only a few documented case among the thousands of simulations:

- production decline during the year: **The harvestable biomass actually includes senescing biomass, which may be dominant if regrowth is poor and a cut is skipped.**
- Two neighbour FR with contrasted index : **threshold effect**
- Meteorological data too variable with the region . **Eg: altitude**
- Absence iof regrowth due to lack of LAI (drought impact too drastic);
- Autumn regrowth to high due to insffient asymetrie of growth between spring and autumn.
- Missed detecton of water deficits in spirng:

. stress coefficient poorly parameterized;
. incertitude on field capacity within the FR;
. Cumlutated Production level low in spring, generating extreme and uncertain index variations.

To be sorted out with version update

Situation in 2020 ?

Management practices and surface updates

Recent Ministery surveys indicate

- A light diminution of cuts

- An increase of sown grasslands

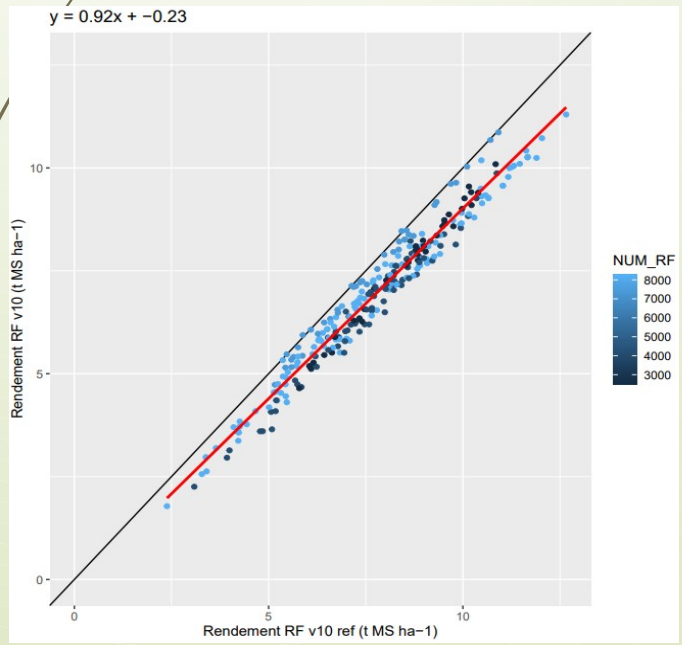
- A decline of Min fertilisation linked to
  + Increase in legume contribution
  + increase of organic fertilisation

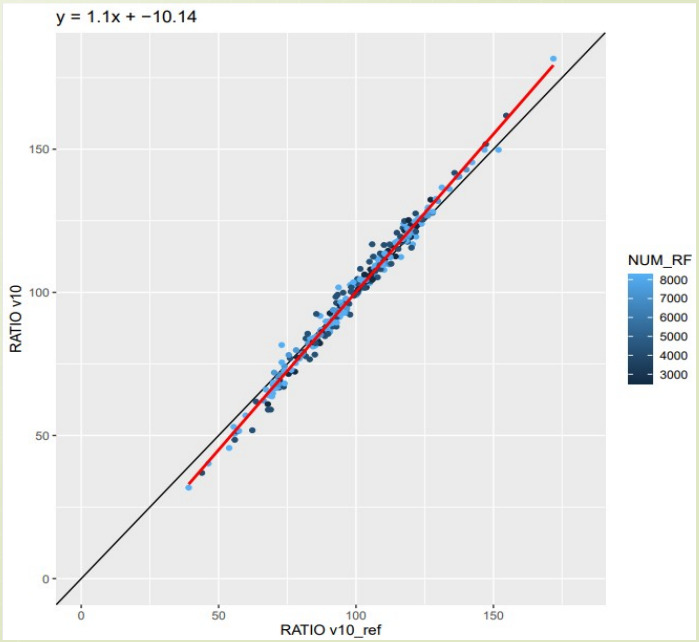
To be tested using the updated version

Test of the impact of management change on production and index

Grand type d'itinéraire technique	1ère coupe (°Cj)	Intervalle entre coupes (°Cj)
F	1500	
FP	1300 (1200)	1300 (1200)
EFP	900 (750)	1100 (1000)
FPP	1300 (1100)	1000
PPP	700	1000
EEEE	900 (750)	800 (850)
PPPP	700 (650)	800
PPPPP	700 (650)	700
PPPPPP	700 (650)	500

+ decrease of N fert rate

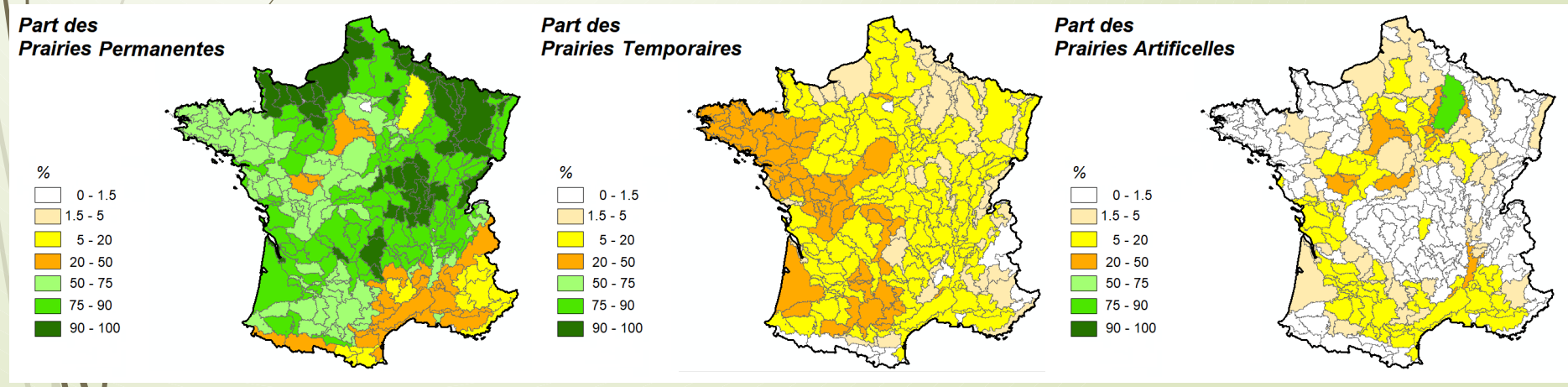




- Modifications.

Modifications .

Surface area update RPG 2017-2019 (P Cantelaube, ODR INRAE).

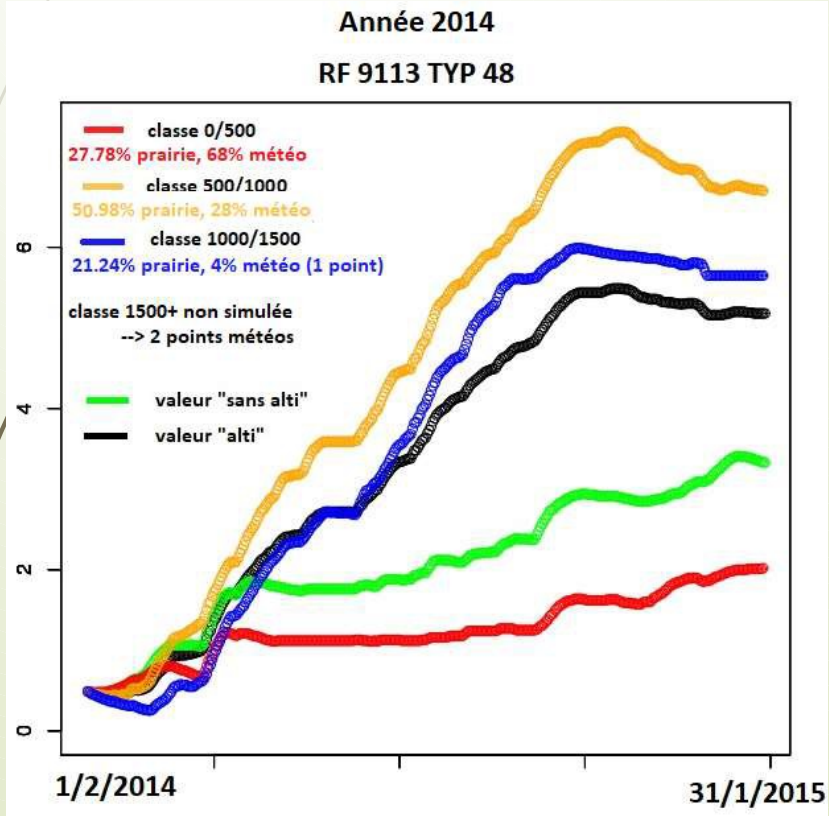


Surfaces en 2018

Modifications

- altitudes per 500 m slice within RF and weighted average

Étude F Souverain, Météo France



Exemple de l'évolution de la production cumulée dans une zone des Pyrénées Orientales **à trois altitudes**, de la pondération selon la distribution des surfaces en prairies ou de la moyenne « sans altitude ».

Modifications

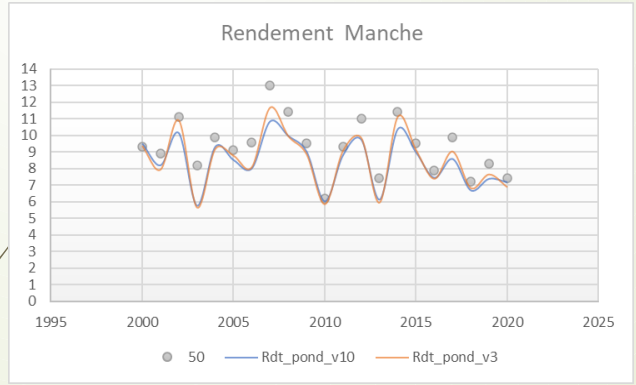
- Implementation of V10 and replacement of V3
  - Input and output files revision as well as routines update and their management
  - V3 variables update to correspond to the V10 variables (esp Output)
  - Check with Meteo France routines update

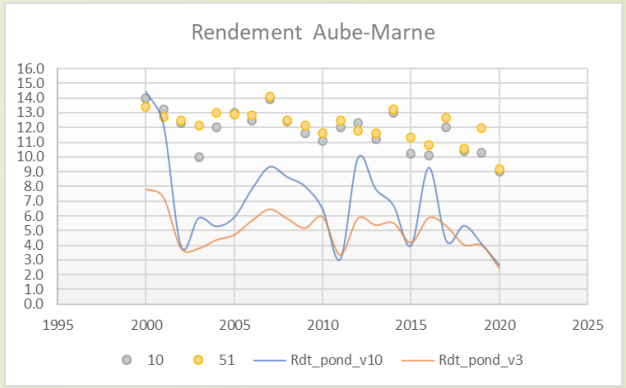
L Strullu, D Ripoche, P Lecharpentier (INRAE) & Franck Souverain (Meteo France)

Modifications

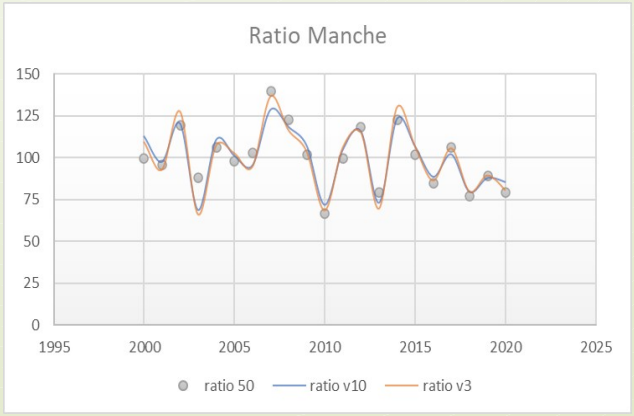
- Independant French Départements estimates and V10

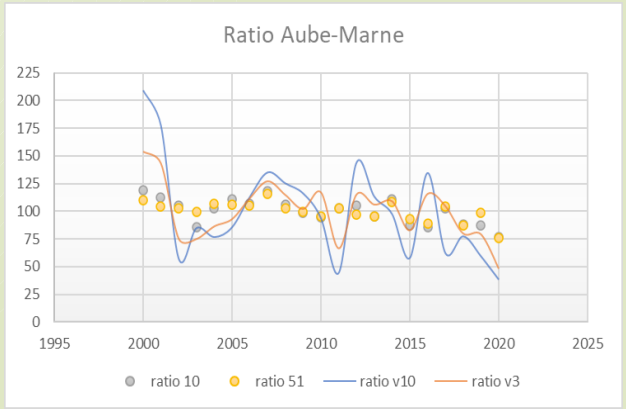
Production au 20 octobre





Indice au 20 octobre



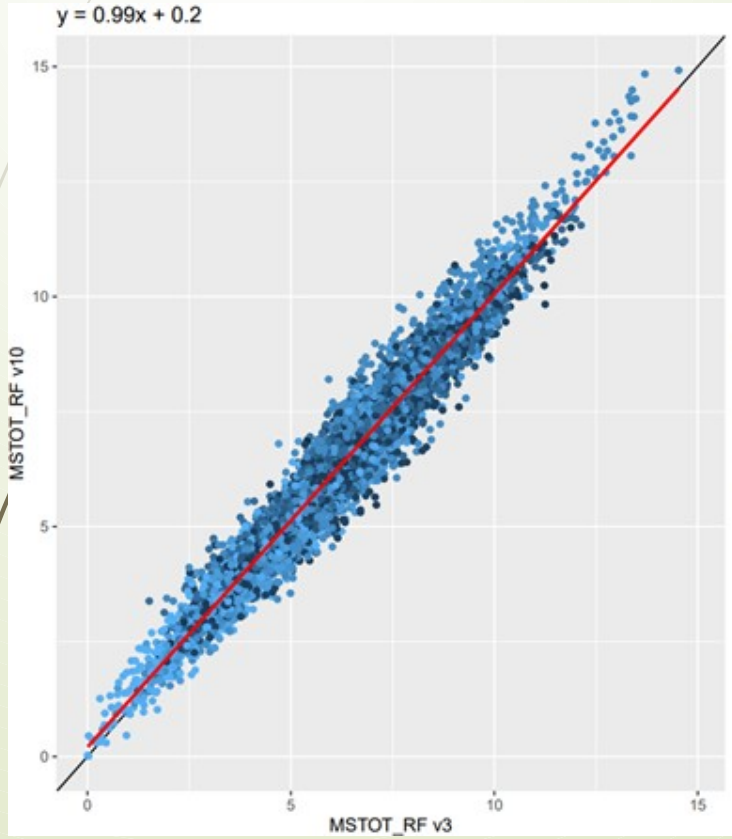


Pairie permanente

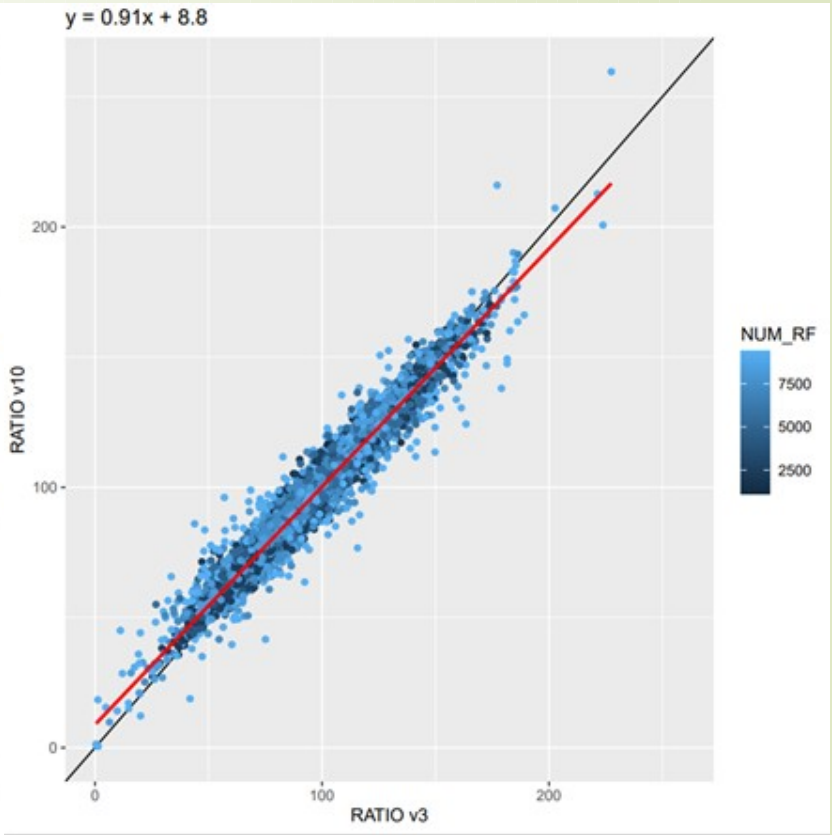
Pairie artificielle

Modifications

- Versions Comparison (permanent grassalnds, V3 in abscissa)



Production au 20 octobre

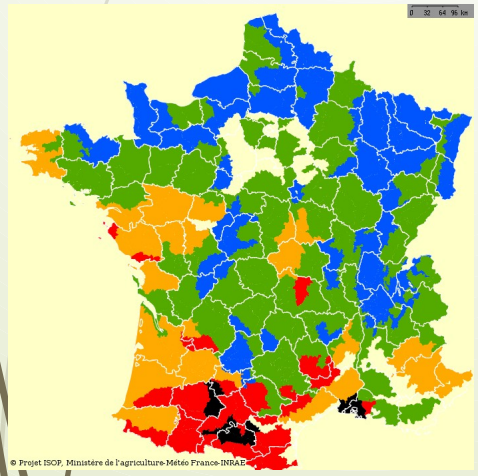


Ratio au 20 octobre

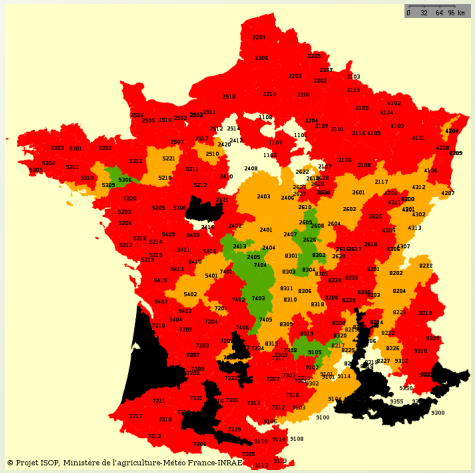
How did it work so far and perspectives?

- Mise en production sur 2022 et 2023 : production de résultats logiques, deux années bien contrastées du point de vue de la situation climatiques.

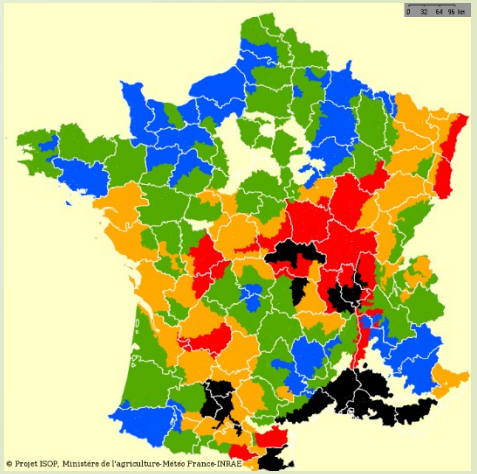
Oct 2021



Oct 2022



Oct 2023

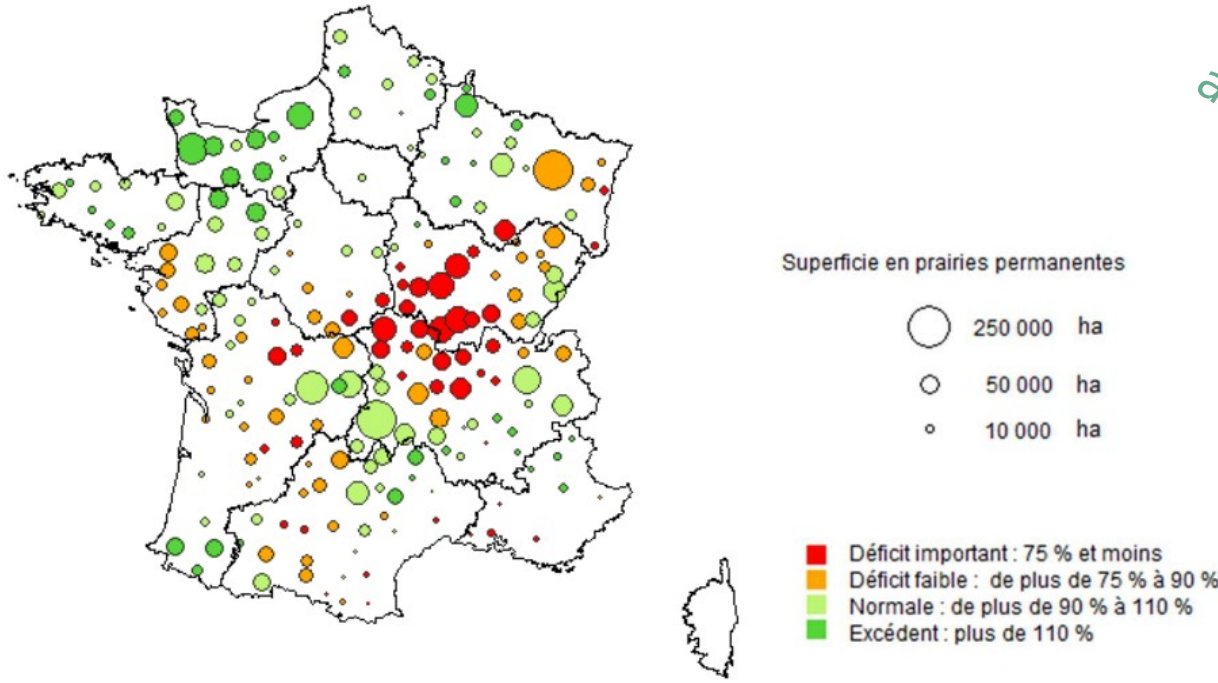


Cartes P Clastre, site
https://w3.avignon.inra.fr/mapserv/isop/isop_accueil.php?type_acc=tp&choix_schema=isop&niveau_legende=detail

Perspectives ?

- intra-RF variability estimate ? unreasonnable given the vast field capacity and soil depth variations (étude SSP MASA)
- Use a new météo grid + unagregated computing (Météo France, évaluation en cours)
- Soil map update, in order to associate to management map in Region (permanent grasslands only)
- CO_2 impacts on RUE et ET
- Compartisons with other indices (satellite images analysis, local measurements of proxi (herbomètre) etc..)

New map for diffusion of the National situation (D Fiche, SSP MASA)



Merci de votre attention !

Note de lecture : l'indicateur de rendement des prairies permanentes Isop, à une date donnée, est égal au rapport entre la pousse cumulée à cette date depuis le début de la campagne et la pousse cumulée à la même date calculée sur la période de référence 1989-2018. La taille des pastilles est proportionnelle aux surfaces en prairies permanentes de chaque RF.

Sources : INRAe, Météo France, SSP