



# **Undersowing Tall fescue in forage cover crops**

## ***The impact of their composition and their cutting date***

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# Undersowing tall fescue seed crop under cover crop

- A long-standing technical reference in France with regional adaptation
  - Winter wheat crop,
  - Spring crop:
    - Barley, pea,
    - Field bean,
    - Sunflower,
    - Flax...



Grass seed crop under winter wheat

# Undersowing tall fescue seed crop under cover crop

- By which criteria can we choose a grass seed cover crop?



- The weed control solutions under cover crop like herbicide or mechanical interventions
  - The quality of seed crop establishment
  - The date of sowing to avoid specific weeds infestation
  - The impact of the cover crop for the following seed production (N effect of legumes...)
  - The income of cover crop: cover crop price or potential forage value



# Forage cover crop for grass seed production

- A few references to establish tall fescue seed production under forage crop:
  - Maize forage cover crop
  - Maize forage cover crop + red clover + tall fescue





# Forage cover crop for grass seed production

- Others references to establish tall fescue seed production under forage crop:

- Triticale, →

- Mixed field pea  
+ triticale



← Winter pea

# Forage background

- Farmers are seeking to be more self-sufficient in terms of forage and protein systems.
- Mixed forage crops (cereal + legumes) are more developed
- Forage value  $\Leftrightarrow$  proportion of légumes
- Is using an immature harvesting a way to increase the value of the forage ?





# Forage cover crop for grass seed production

Are these mixed forage crops new alternatives to establish pasture or grass seed production?

- => Research project « Procerherb » 2019-2022



in partnership with the chamber of agriculture of “Les Pays de la Loire”  
forage experimental network

# « Procerherb » project

## Seed production

- Objective :
  - To evaluate the influence of different mixed forage cover crops harvested with an early or late cut on tall fescue seed crop establishment and seed yield.
- Method
  - 2 series of two-year trials (2019-2020 and 2021-2022) at FNAMS Angers - France
  - 6 cover crop treatments tested in a randomized block design (4 replic.)
  - Direct sowing in October
  - 2 dates of the cover crop forage cutting: April and June
    - => Dry matter for forage cutting, forage quality.
  - Tall fescue seed harvest the following year
    - => Establishment quality of the tall fescue followed by the seed yield



# Sowing density in mixed forage crop tested with undersown tall fescue & cover crop harvest date

N°	Cover crop	Harvest date (actual date for the 2 successive trials)	Sowing density (grain/m <sup>2</sup> )						
			Wheat	Triticale	Oat	Pea	Field pea	C. vetch	Field bean
T1	Ref. winter wheat	Grain harvest at maturity (09-21 July)	300						
T2	Mixed forage crop A (triticale +)	Late forage cutting (13-16 June)		250			15	15	
T3	Mixed forage crop B (legumes +)	Early cutting forage (17-24 april)		125			15	15	20
T4		Late cutting forage (06-16 June)		125			15	15	20
T5	Mixed forage crop C (legumes ++)	Early cutting forage (17-24 april)			40	40	15	15	10
T6		Late cutting forage (06-16 June)			40	40	15	15	10

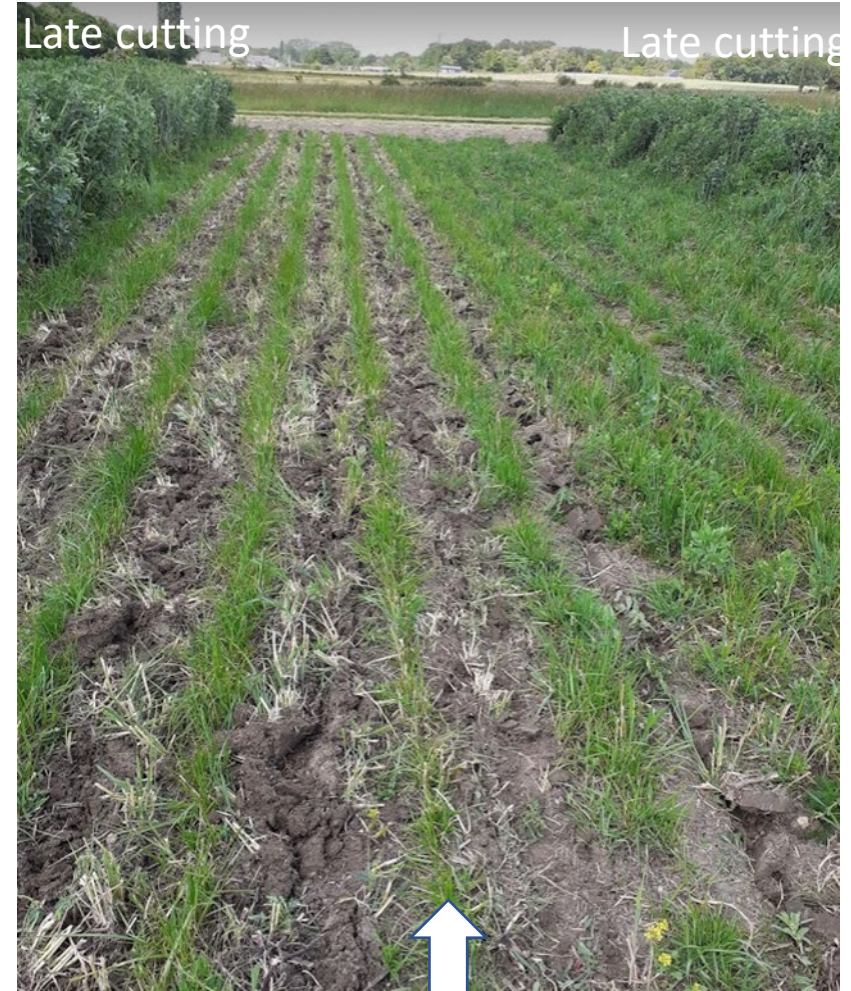
# Procerherb Trial - Brain

2019



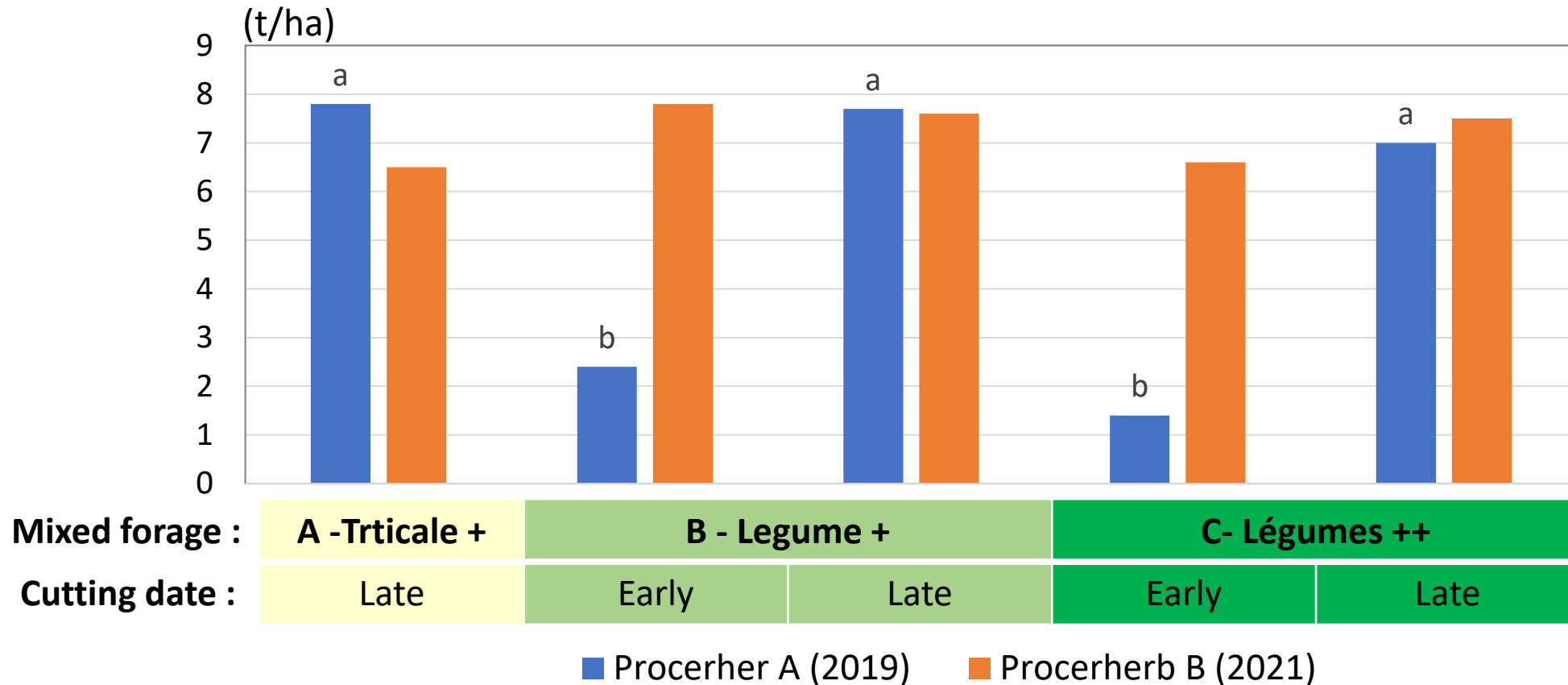
Early forage cutting (april)

2021



Early forage cutting (april)

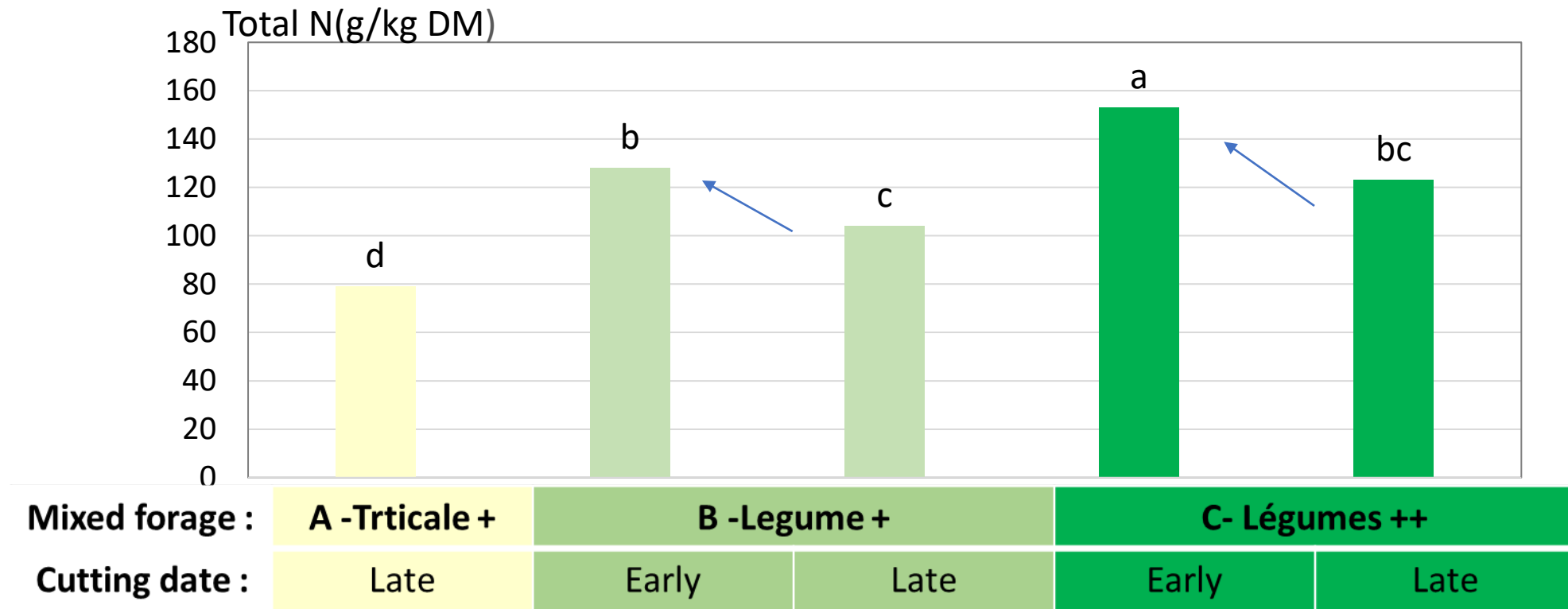
# Dry matter for forage cutting on the 2 successive trials with undersown tall fescue - FNAMS Brain





# Forage quality according to the date of cutting and the forage cover crop

(8 trials Procer network 2019-2021)



# Establishment quality and seed yield of the tall fescue

N°	Cover crop	Harvest date	Establishment quality of the tall fescue (scale 0 to 10 = optimal)	
			Procer A 09/10/19	Procer B 15/07/21
T1	Réf. winter wheat	Grain harvest at maturity	10	-
T2	Mixed forage crop ( <i>Tritical +</i> )	Late forage cutting	10	10
T3	Mixed forage crop B ( <i>mixed</i> )	Early cutting forage	10	10
T4		Late cutting forage	9,4	8
T5	Mixed forage crop C (protein crop +)	Early cutting forage	10	10
T6		Late cutting forage	9	7

# Establishment quality and seed yield of the tall fescue

N°	Cover crop	Harvest date	Establishment quality of the tall fescue (scale 0 to 10 = optimal)		% soil cover by the tall fescue	
			Procer A 09/10/19	Procer B 15/07/21	Procer A 09/10/19	Procer B 15/07/21
T1	Réf. winter wheat	Grain harvest at maturity	10	-	26 abc	-
T2	Mixed forage crop ( <i>Tritical +</i> )	Late forage cutting	10	10	28 abc	23 .b
T3	Mixed forage crop B ( <i>mixed</i> )	Early cutting forage	10	10	31 ab.	56 a.
T4		Late cutting forage	9,4	8	18 ..c	13 .b
T5	Mixed forage crop C (protein crop +)	Early cutting forage	10	10	34 a.	58 a.
T6		Late cutting forage	9	7	23 abc	33 ab



# Establishment quality and seed yield of the tall fescue

N°	Cover crop	Harvest date	Establishment quality of the tall fescue (scale 0 to 10 = optimal)		% soil cover by the tall fescue		Tall fescue seed yield (kg/ha)	
			Procer A 09/10/19	Procer B 15/07/21	Procer A 09/10/19	Procer B 15/07/21	Procer A 2019/20	Procer B 2021/22
T1	Réf. winter wheat	Grain harvest at maturity	10	-	26 abc	-	515	655 .b
T2	Mixed forage crop ( <i>Tritical +</i> )	Late forage cutting	10	10	28 abc	23 .b	428	821 ab
T3	Mixed forage crop B ( <i>mixed</i> )	Early cutting forage	10	10	31 ab.	56 a.	420	827 ab
T4		Late cutting forage	9,4	8	18 ..c	13 .b	491	760 ab
T5	Mixed forage crop C (protein crop +)	Early cutting forage	10	10	34 a.	58 a.	677	1013 a.
T6		Late cutting forage	9	7	23 abc	33 ab	571	641 .b

# Conclusion

- => Mixed cereal-legume cover crop: a new possible alternative to establish tall fescue seed crop
- Using an early cutting:

## Advantages:

- ✓ Forage value, self-sufficiency protein system (with Legume ++)
- ✓ Establishment quality
- ✓ Weed control & purity
- ✓ Seed yield

## Disadvantage :

- ✗ Forage productivity

# Conclusion

## Using late cutting

- Advantage:

- ✓ Regularity of forage production

## Disadvantages

- ✗ Forage value
- ✗ Establishment quality
- ✗ Potential seed yield losses





*Thank you for your attention*

