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# N AND S CYCLES IN CRUCIFER-LEGUME COVER CROP MIXTURES

Antoine COUËDEL<sup>1,\*</sup> - Lionel ALLETTO<sup>1,2</sup> - Éric JUSTES<sup>1,3</sup>

<sup>1</sup> AGIR, Université de Toulouse, INRA, INPT, INP-EI PURPAN, Castanet-Tolosan, France; <sup>2</sup> Chambre Régionale d'Agriculture Occitanie, 31321 Castanet-Tolosan, France; <sup>3</sup> CIRAD, UMR SYSTEM, Univ. Montpellier, CIHEAM-IAMM, INRA, Montpellier SupAgro, 34980 Montpellier, France. \*corresponding author: antoine.couedel@inra.fr

## Background



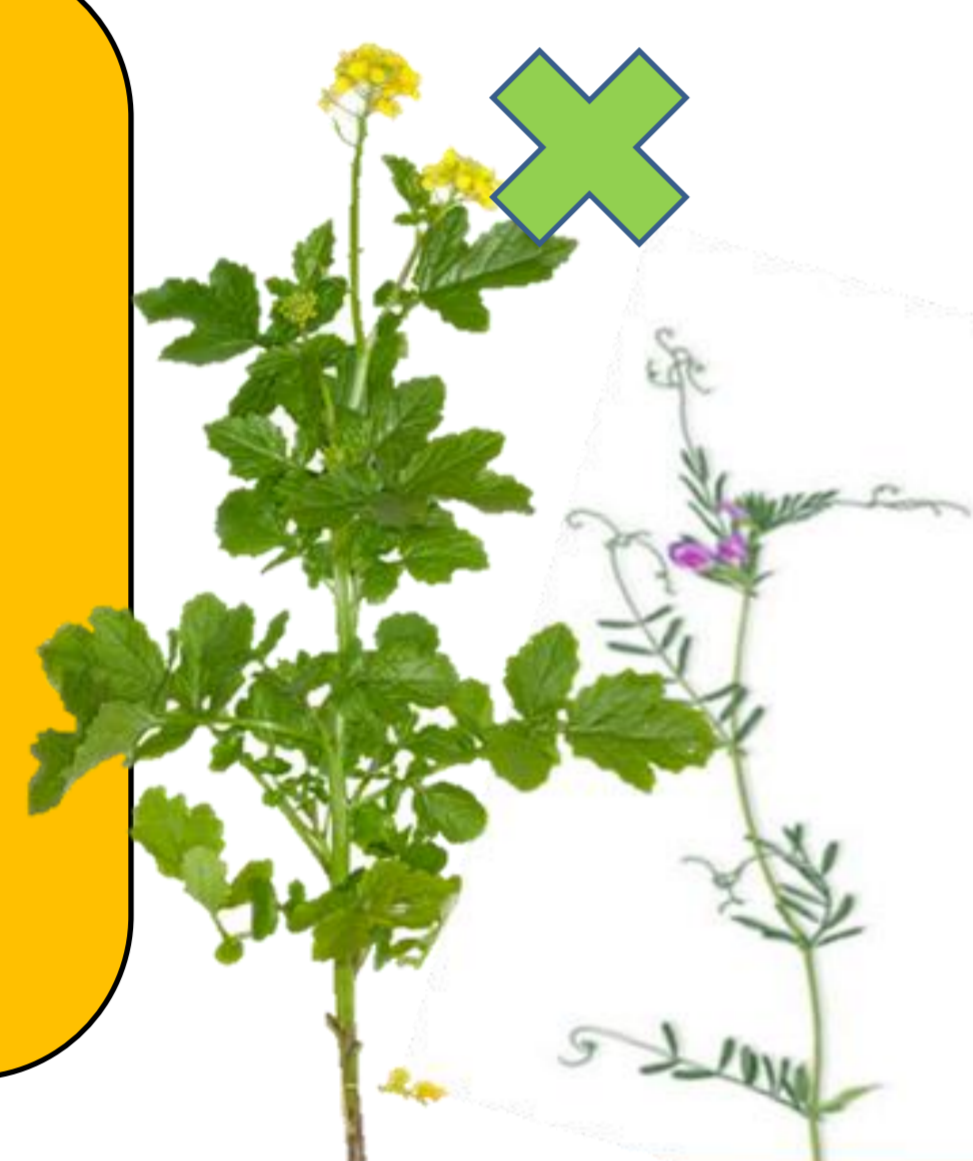
	Nitrate Catch crop	Sulphate catch crop	N green manure	S green manure
Crucifers sole cover crops	Strong	Strong	Weak	Strong
Legumes sole cover crops	Weak	Weak	Strong	Weak
Mixtures	?	?	?	?

**Question :** Is there a mutualisation of services related to N and S cycles in crucifer and legume cover crop mixtures ?

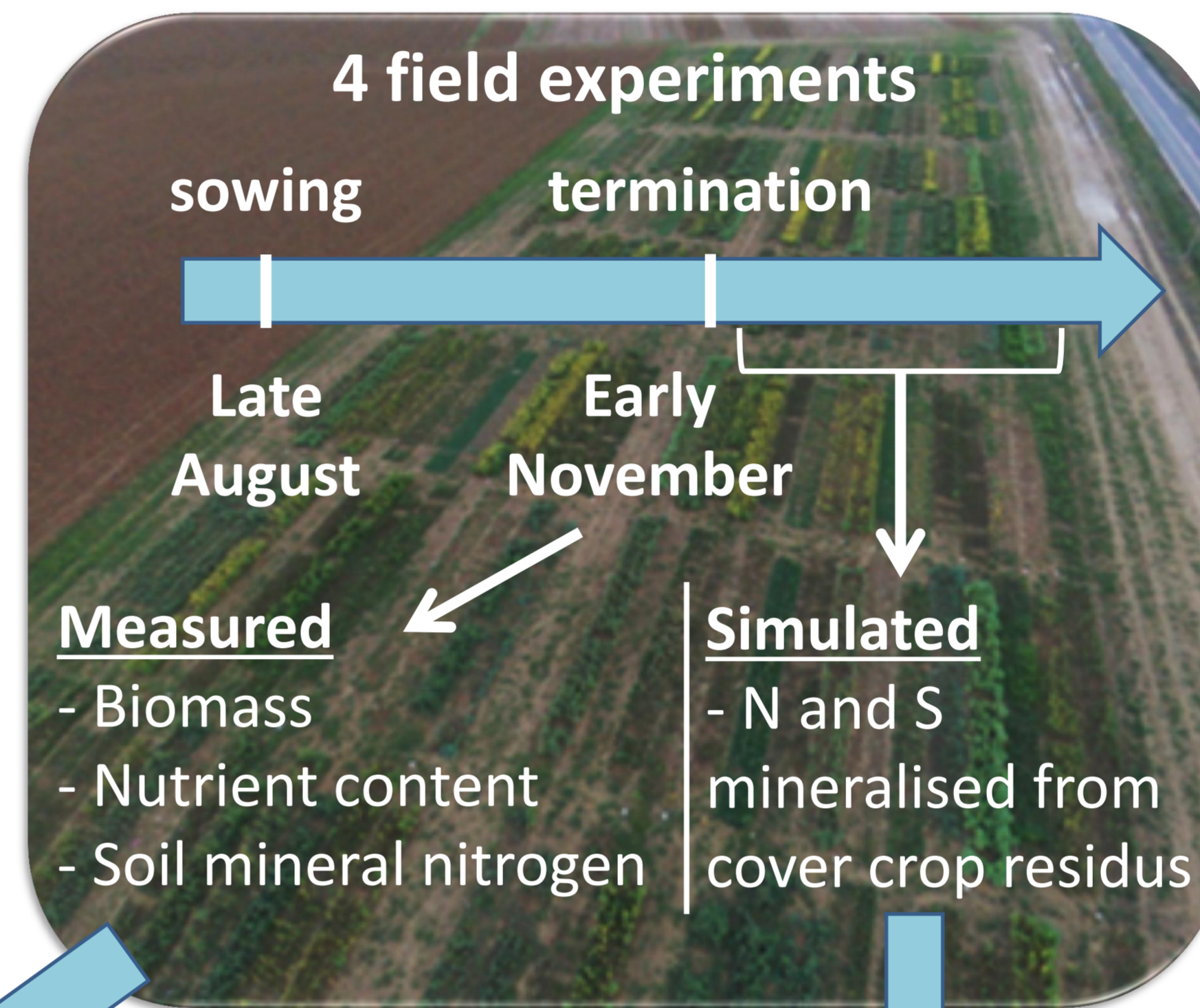
## Material and methods

98 bispecific mixtures

- Rape
- Turnip rape
- Turnip
- Ethiopian mustard
- White mustard
- Indian mustard
- Forage radish
- Rocket



- Egyptian clover
- Crimson clover
- Purple vetch
- Common vetch
- Hairy vetch
- Soya bean
- Faba bean
- Pea
- Lupin

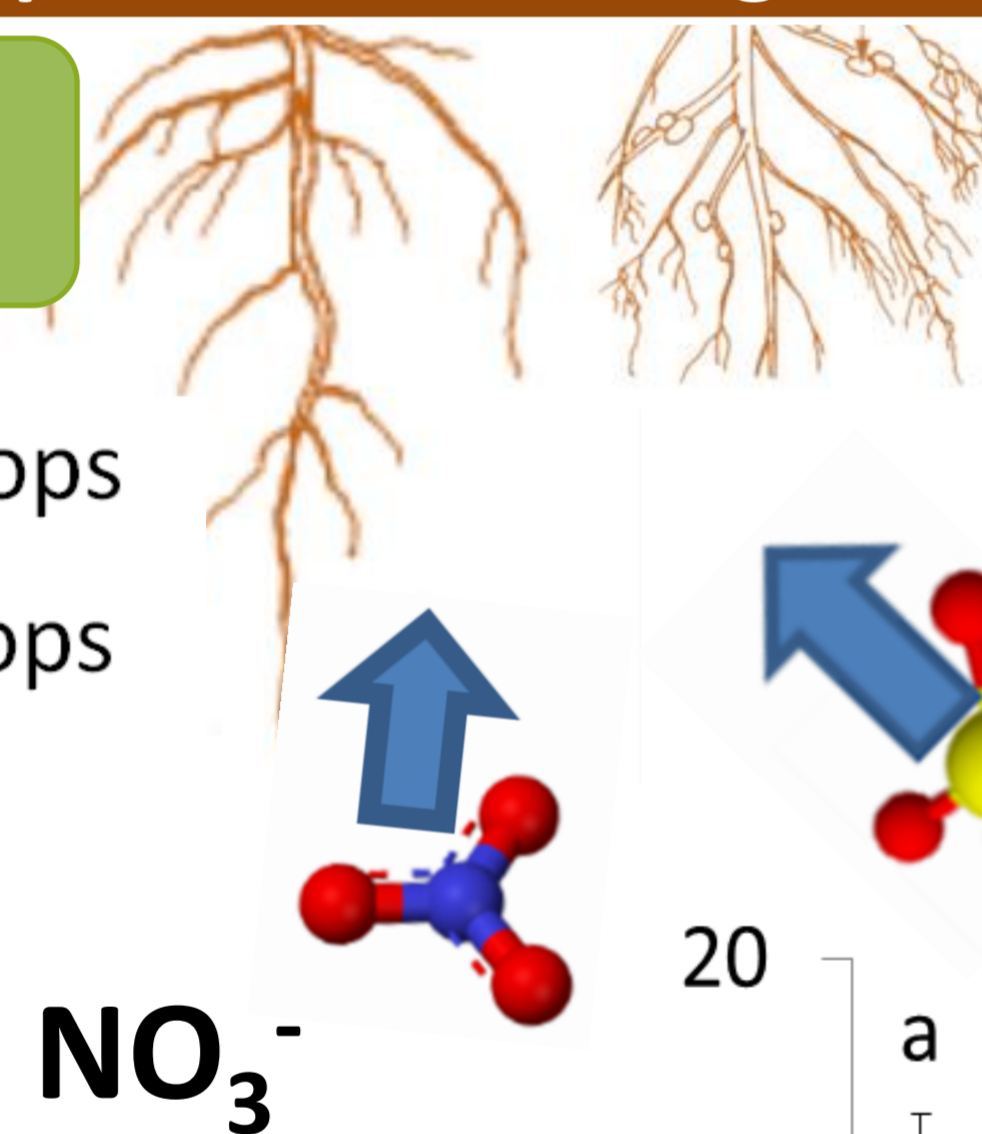


### Catch crop services during the growing period

### Nutrient recycling services after cover crop termination

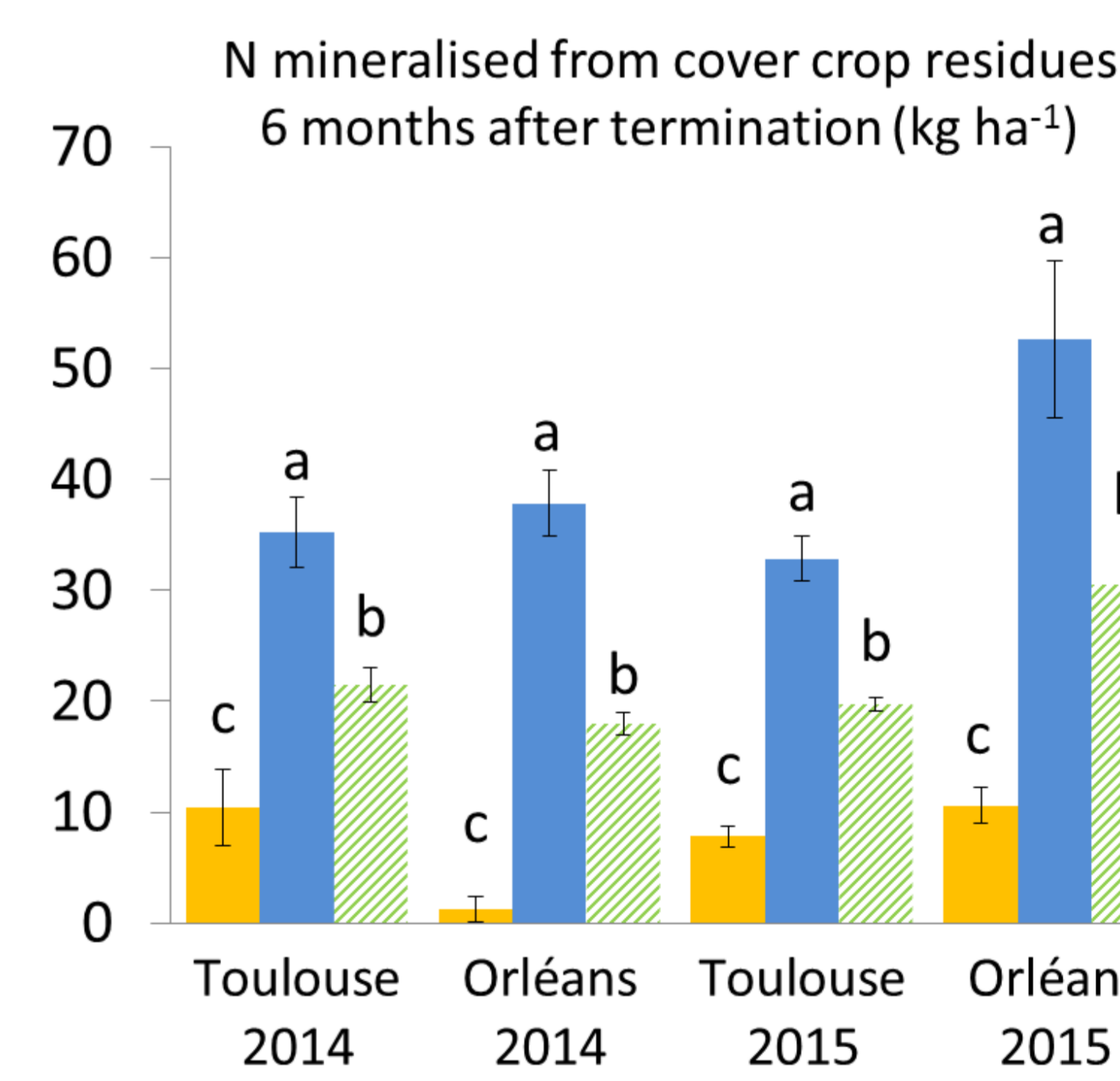
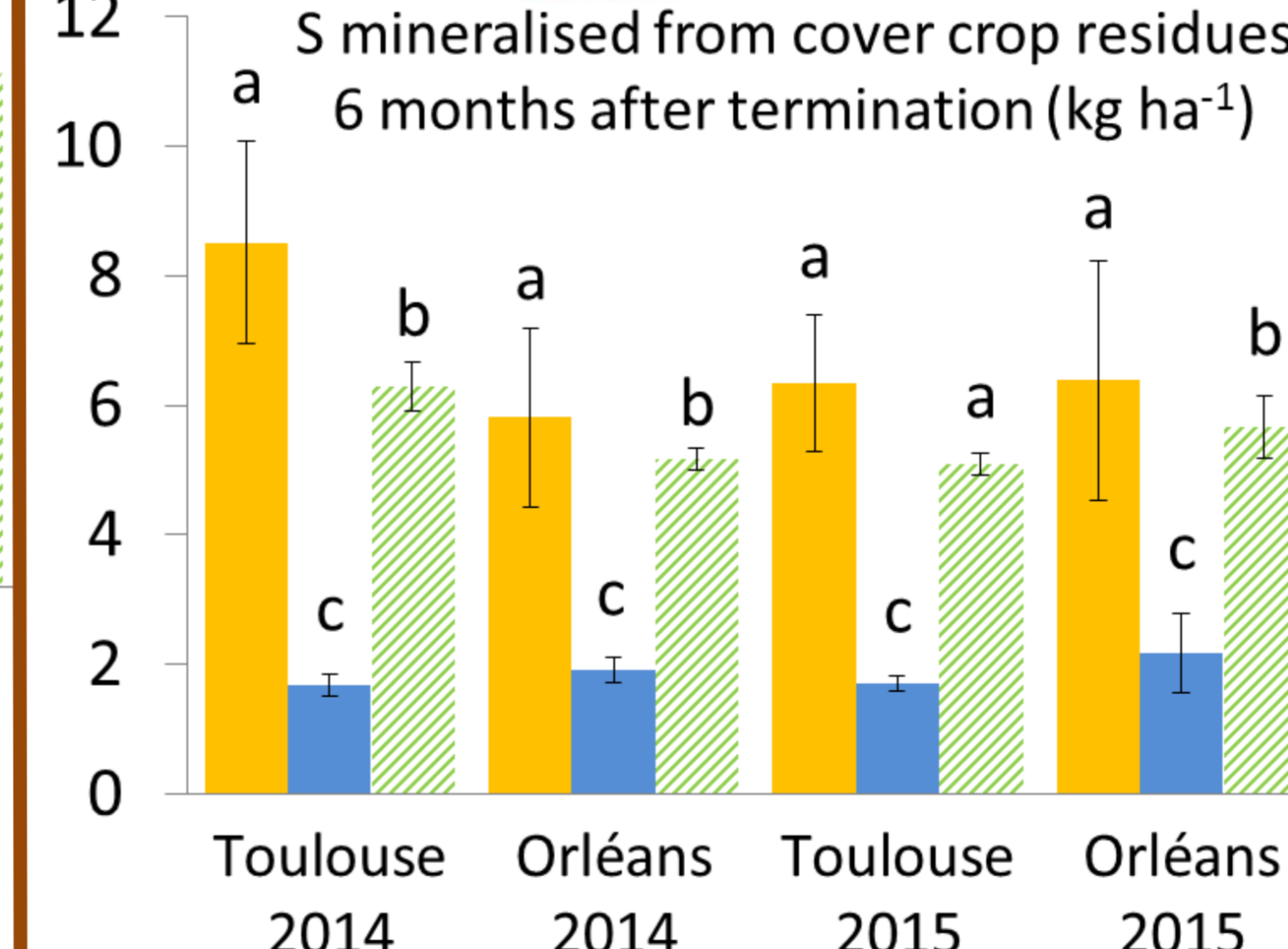
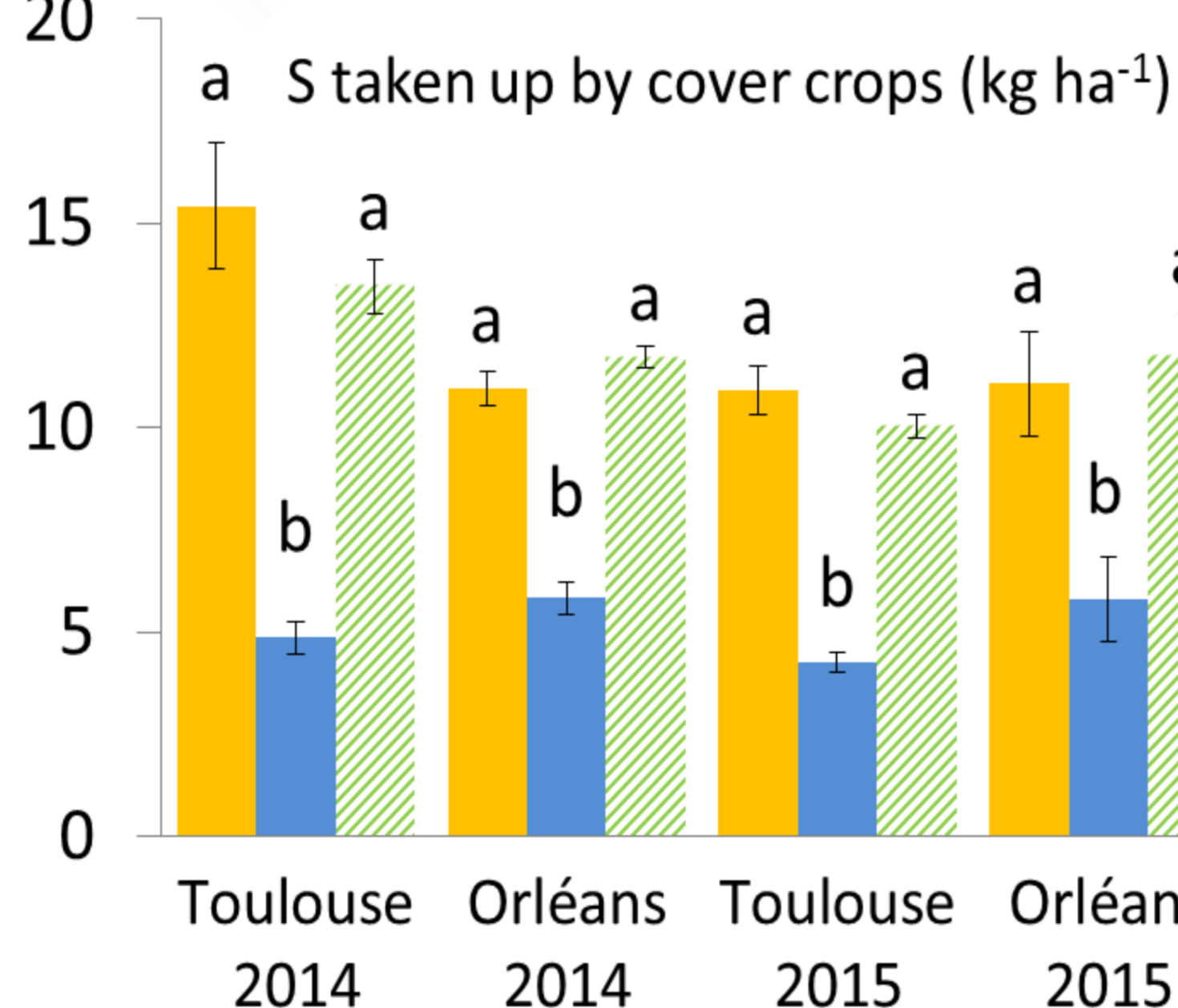
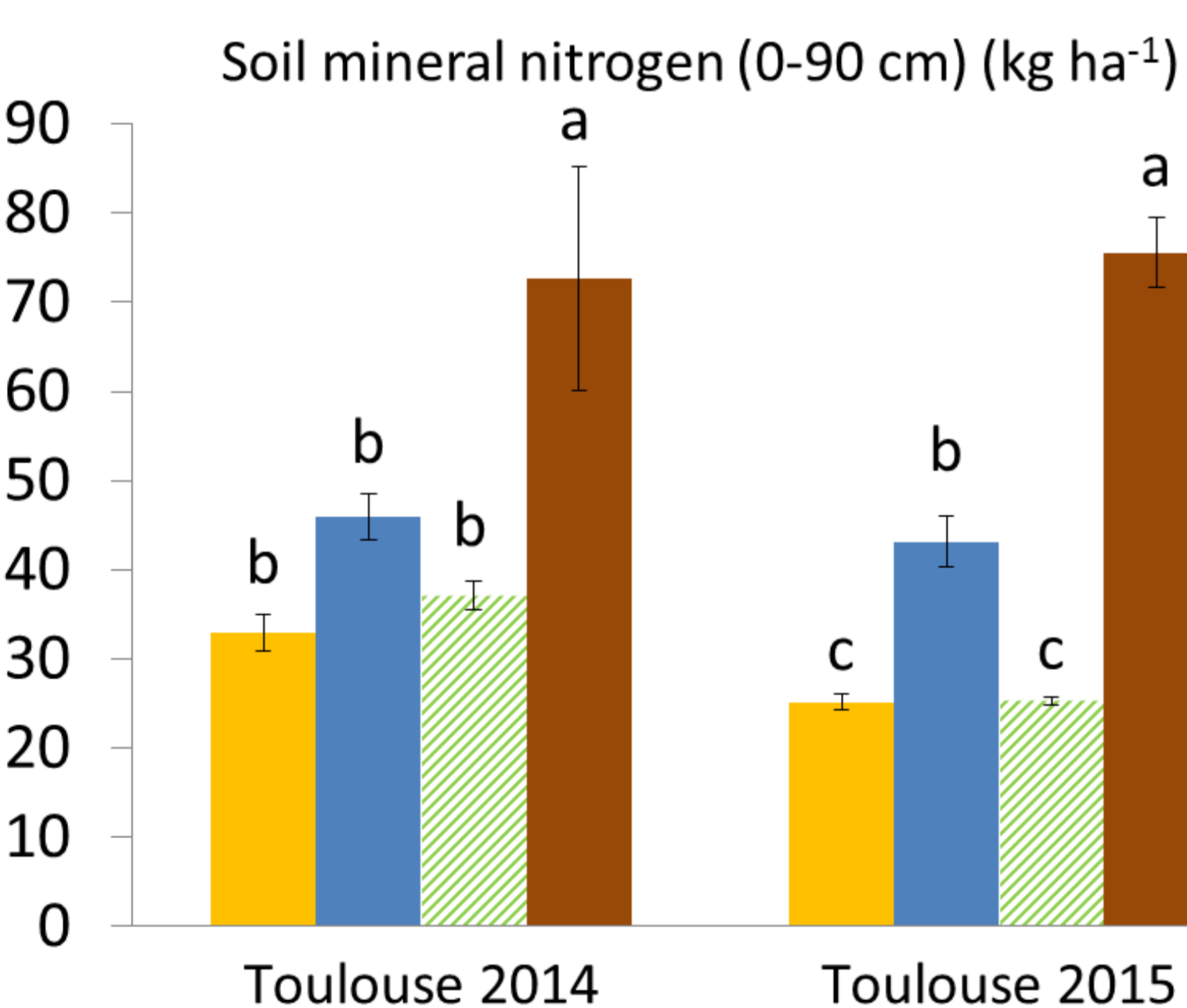
## Results

- crucifers as sole crops
- legumes as sole crops
- mixtures
- bare soil



$\text{NO}_3^-$

$\text{SO}_4^{2-}$



## Conclusion

<b>Crucifers</b>	100%*	100%	18%	100%
<b>Legumes</b>	66%	30%	100%	23%
<b>Mixtures</b>	98%**	99%**	63%**	85%**

\*The service is provided in proportion of the best sole crop family (average of all species tested), which then is considered at 100%.  
\*\*Higher than the average of sole cover crops

→ Our study confirms for a wide range of cover crop species and on four sites x years that crucifer-legume mixtures can provide multi-ecosystem services by **mutualising services of N and S cycles**.

### References for more informations

Couedel, A., Alletto, L., Justes, É., 2018a. Plant Soil. doi:10.1007/s11104-018-3615-87  
Couedel, A., Alletto, L., Tribouillois, H., Justes, E., 2018b. Agric. Ecosyst. Environ. 254, 50–59. doi:10.1016/j.agee.2017.11.017