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N AND S CYCLES IN CRUCIFER-LEGUME COVER CROP MIXTURES

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Background



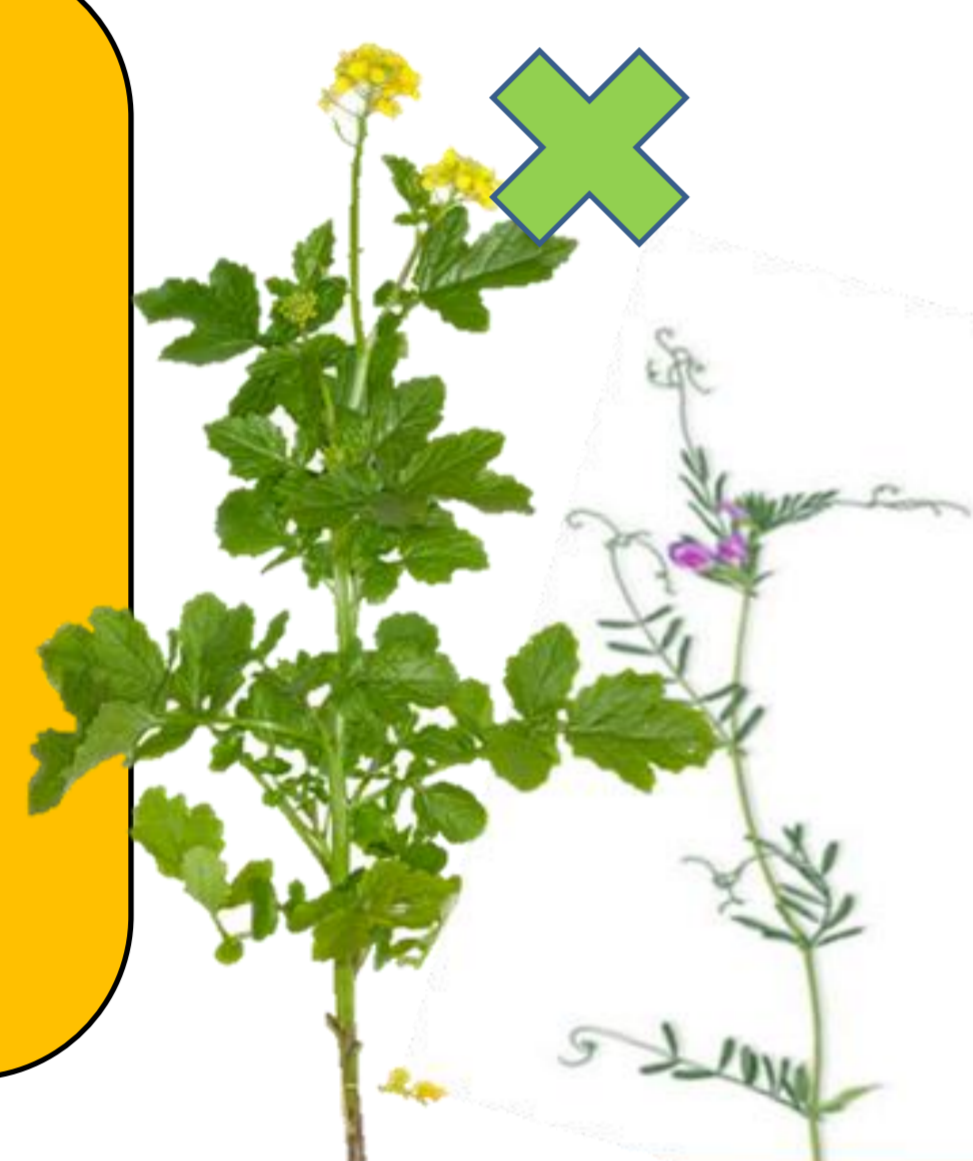
	Nitrate Catch crop	Sulphate catch crop	N green manure	S green manure
Crucifers sole cover crops	Strong	Strong	Weak	Strong
Legumes sole cover crops	Weak	Weak	Strong	Weak
Mixtures	?	?	?	?

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

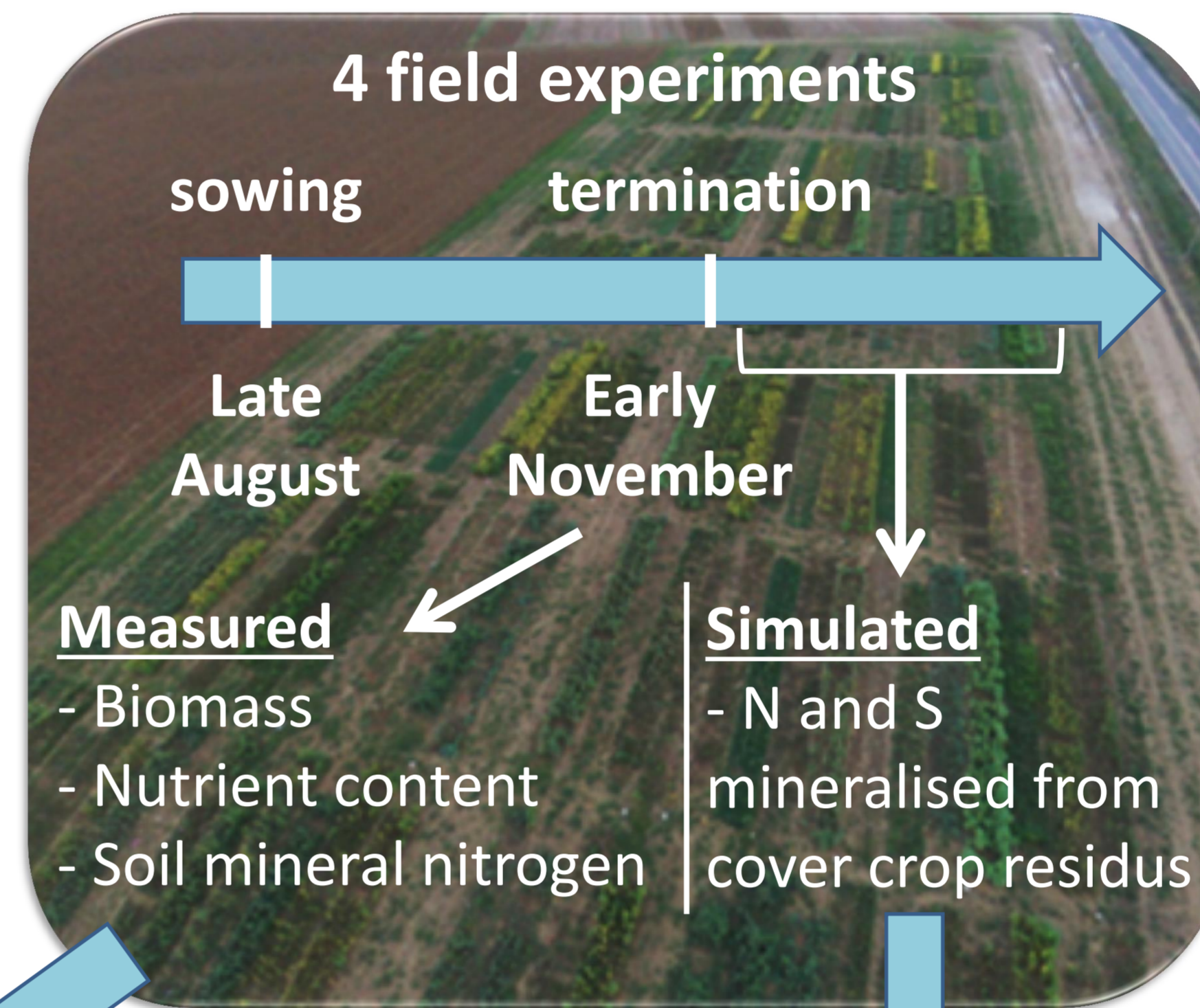
Material and methods

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

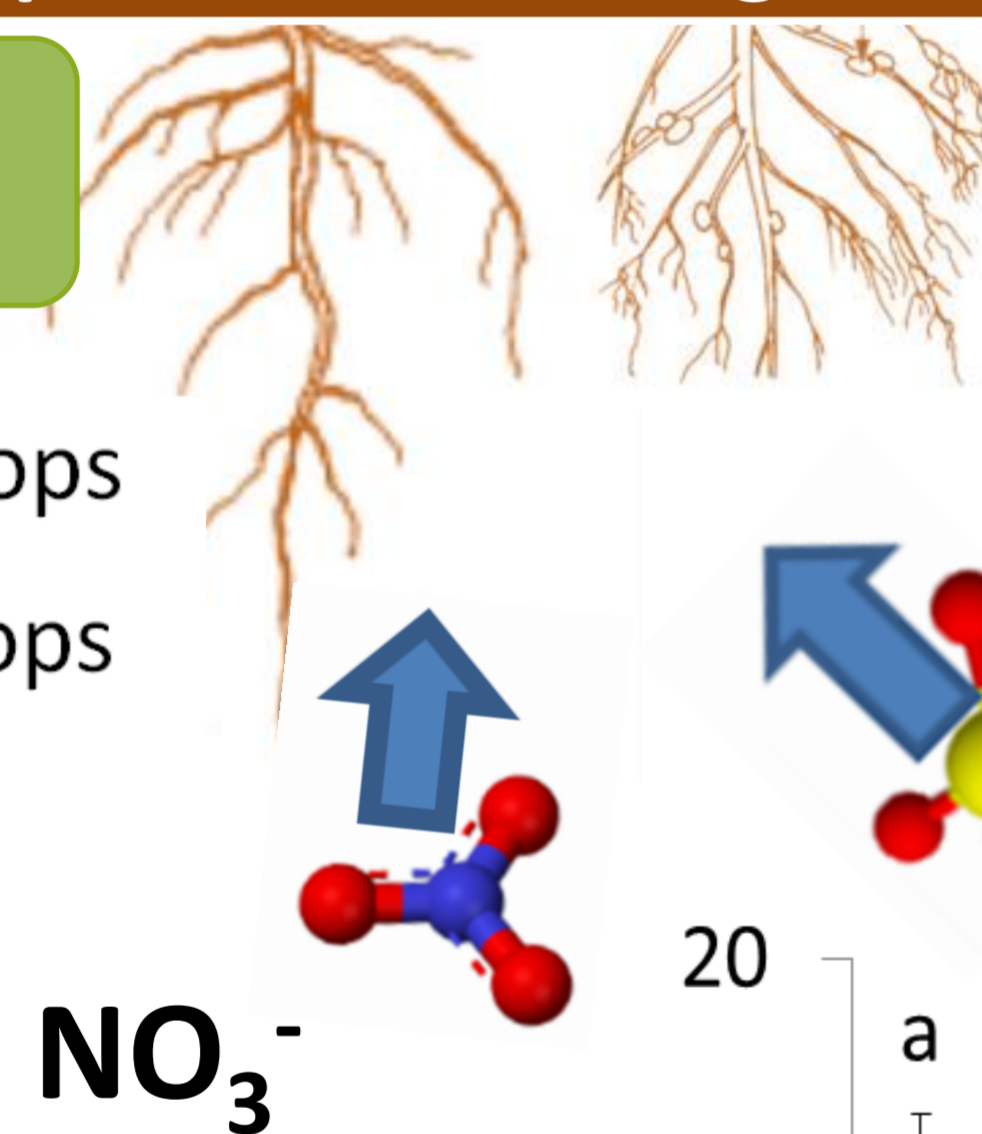


Catch crop services during the growing period

Nutrient recycling services after cover crop termination

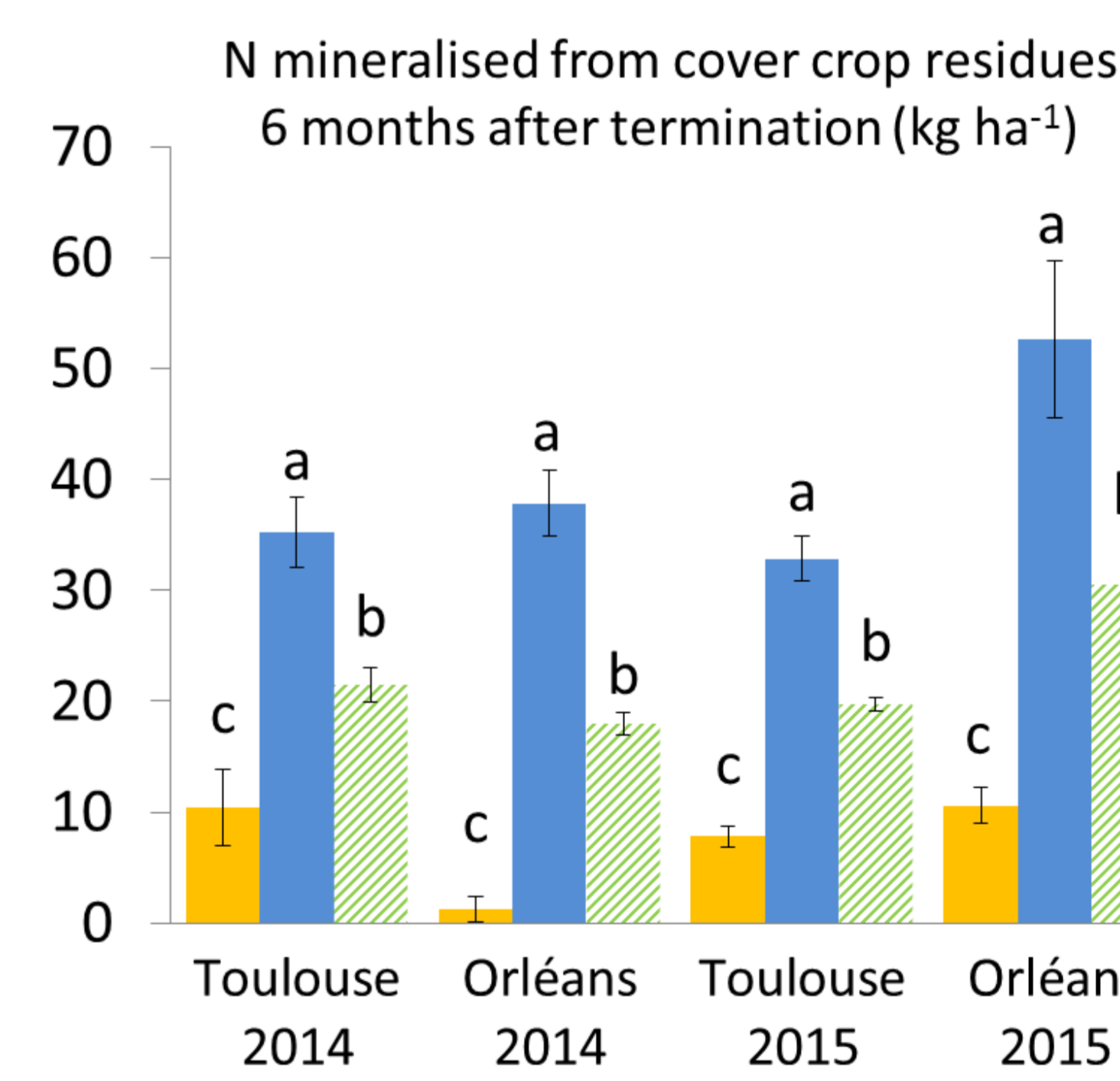
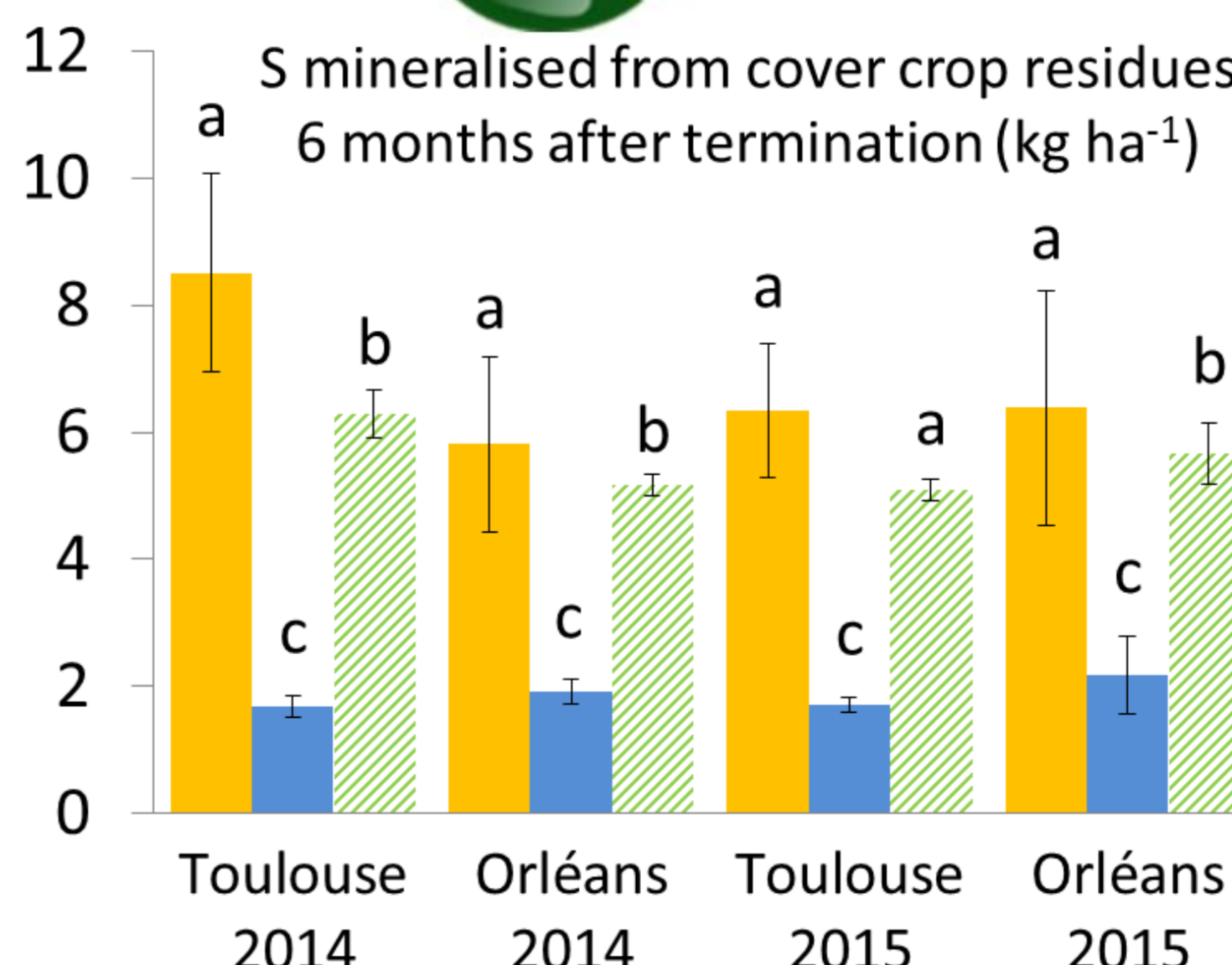
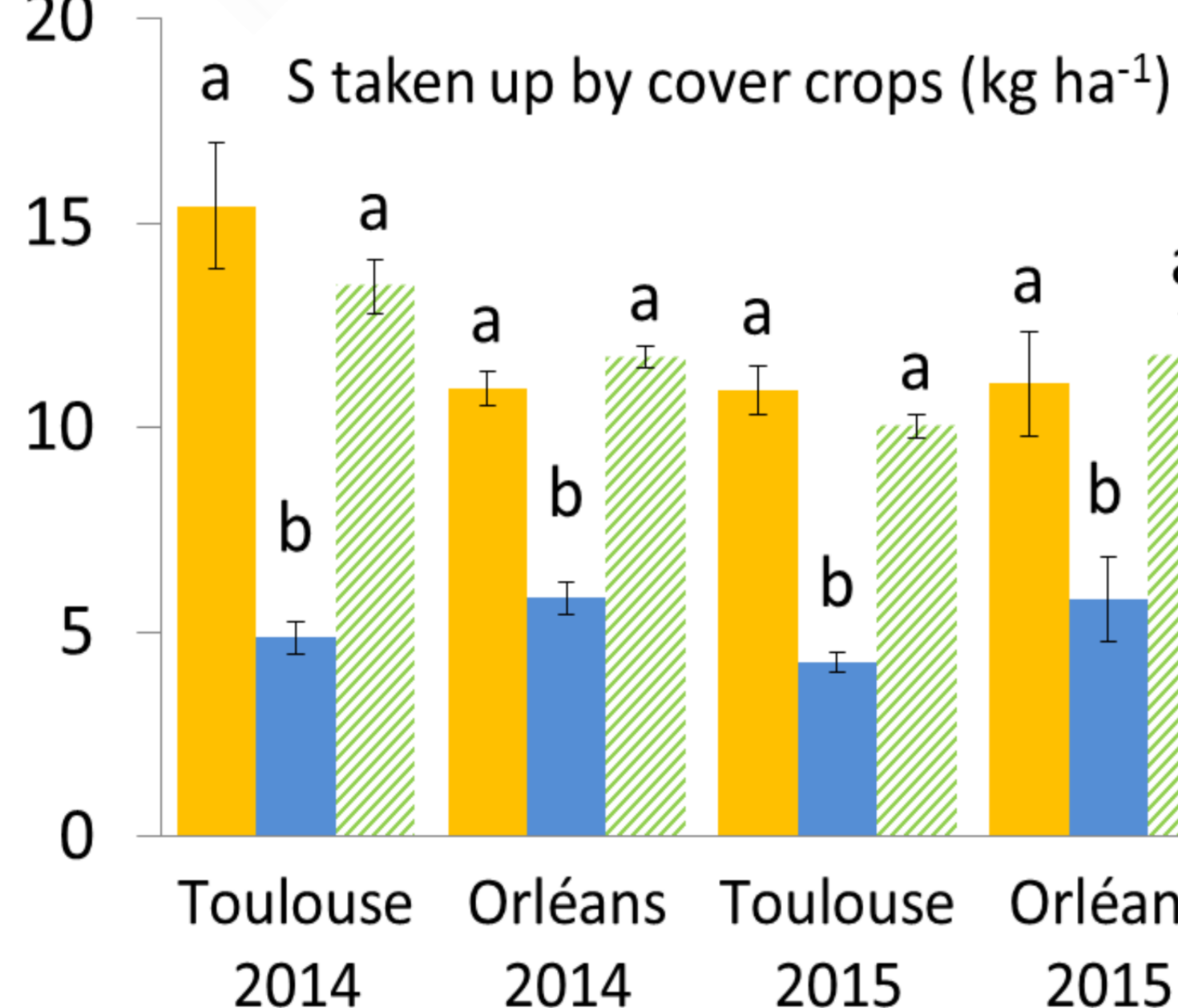
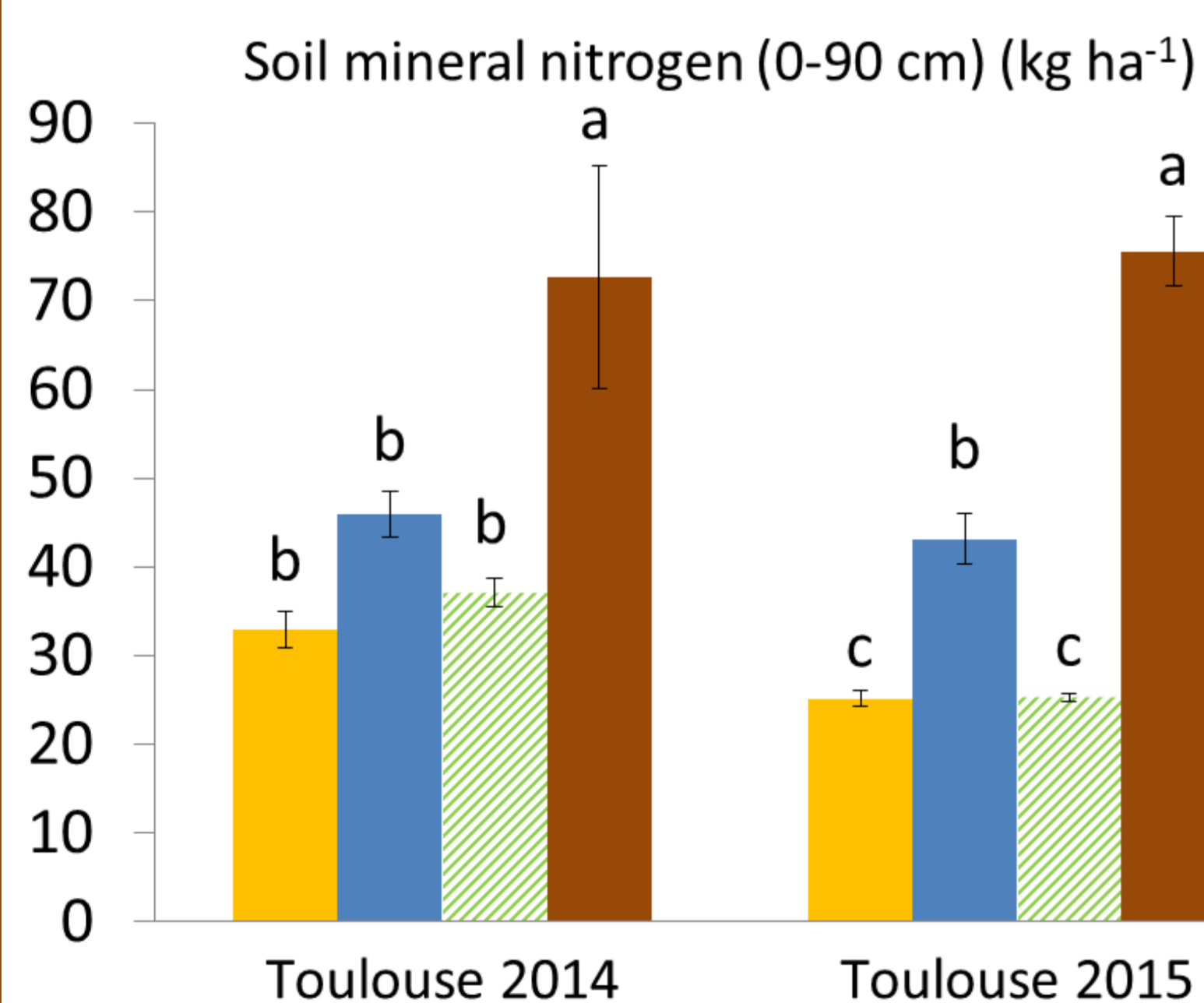
Results

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



NO_3^-

SO_4^{2-}



Conclusion

Crucifers	100%*	100%	18%	100%
Legumes	66%	30%	100%	23%
Mixtures	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