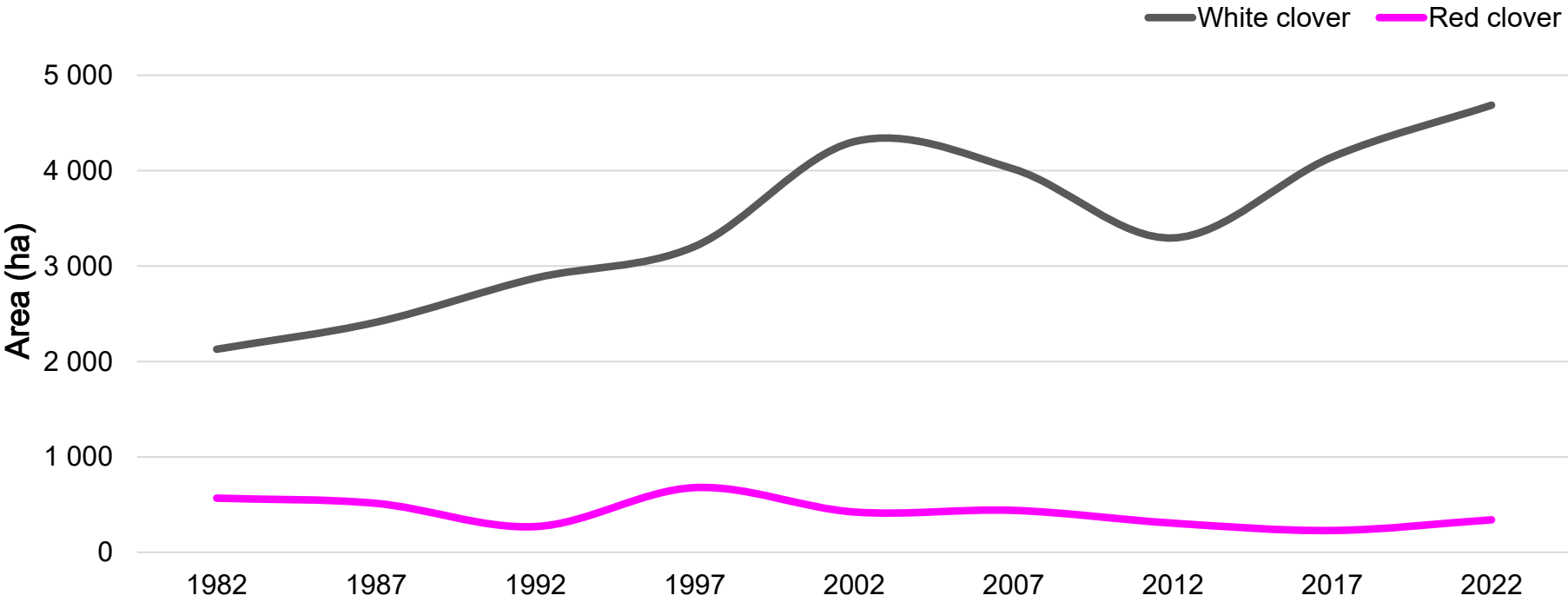


# SEED PRODUCTION OF RED CLOVER

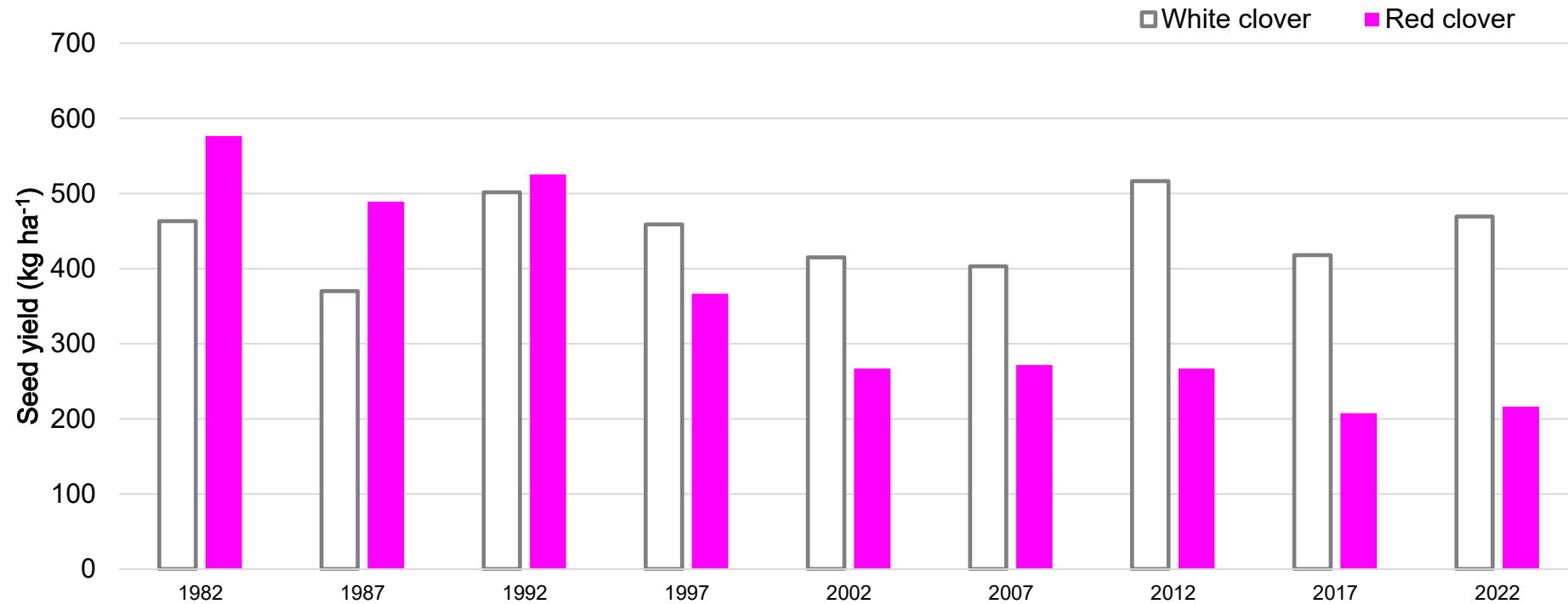
BIRTE BOELT; SHUXUAN JING; HENRIK BAK TOPBJERG & RENÉ GISLUM

# SEED PRODUCTION AREA: RED AND WHITE CLOVER IN DENMARK



SEED YIELD:

# RED AND WHITE CLOVER IN DENMARK



# SEED YIELD DECLINE—REASON?

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## PREVIOUSLY WE TESTED:

- Reduction of biomass prior flowering
- Pest control
- Plant growth regulators
- Field size

**NONE OF THOSE HAD SIGNIFICANT EFFECT ON SEED YIELD!**

# SEED YIELD DECLINE—REASON?

---

## PREVIOUSLY WE TESTED:

- Reduction of biomass prior flowering
- Pest control
- Plant growth regulators
- Field size

IS IT DUE TO LACK OF POLLINATION?







# SEED YIELD EXPERIMENT

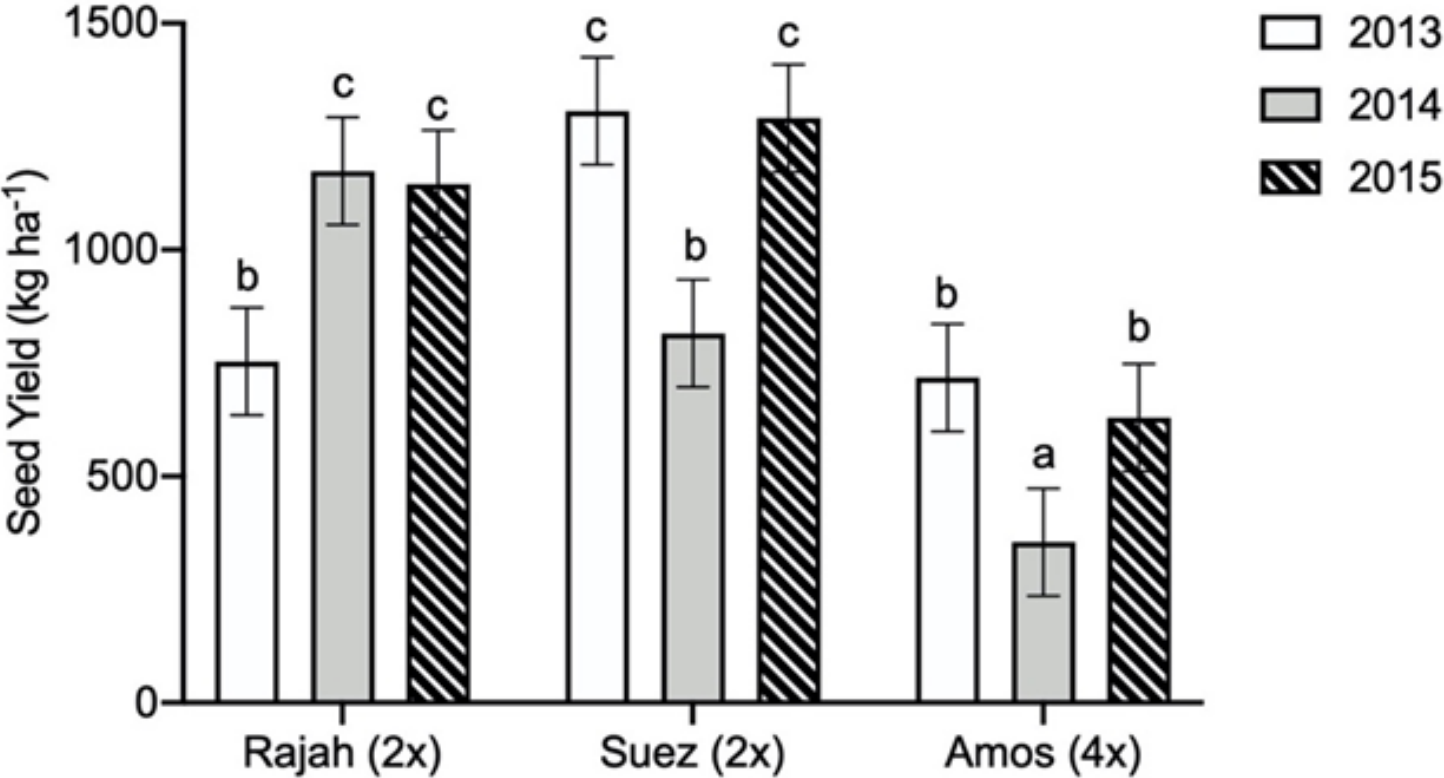
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Field experiment in AU-Flakkebjerg 2013-2015

- Three cultivars
- (Rajah (2x); Suez (2x) and Amos (4x))
- Undersown in spring barley
- Seed yield components in 2014 and 2015



# SEEDYIELD, THREE CULTIVARS



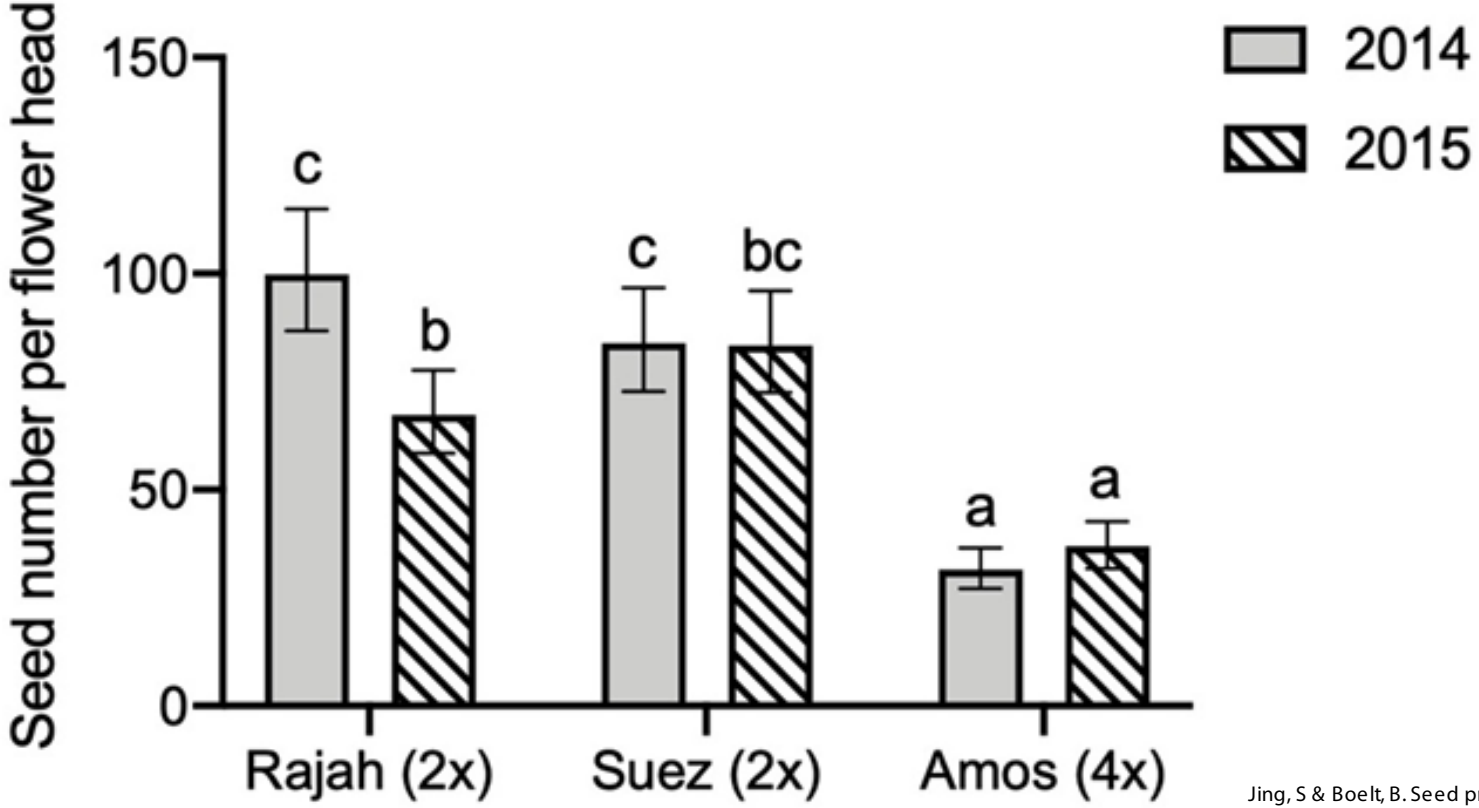
Jing, S & Boelt, B. Seed production of red clover (*Trifolium pratense*L.) under Danish field conditions. *Agriculture* 2021, 11, 1289.

<https://doi.org/10.3390/agriculture11121289>





# SEEDNUMBERPERFLOWERHEAD

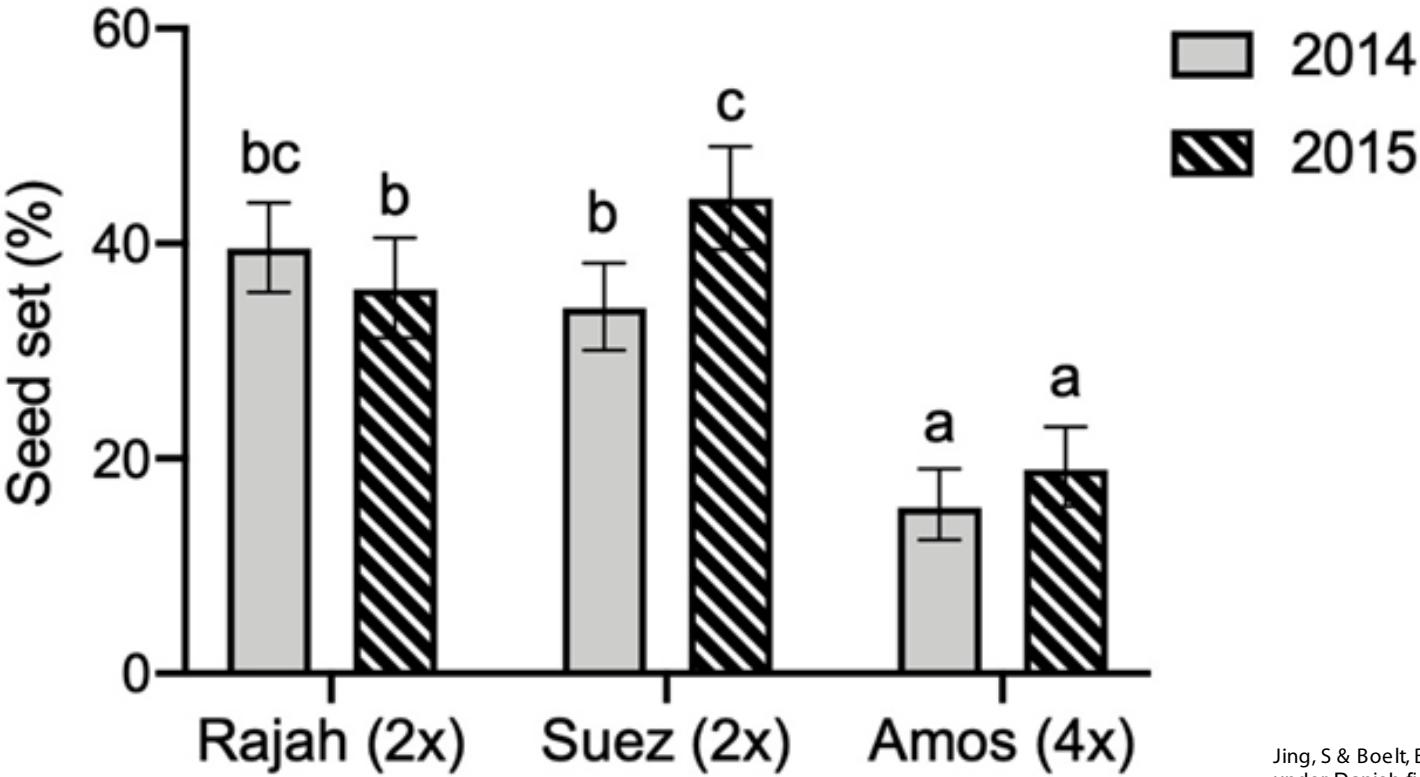


Jing, S & Boelt, B. Seed production of red clover (*Trifolium pratense*L.) under Danish field conditions. *Agriculture* 2021, 11, 1289.

<https://doi.org/10.3390/agriculture11121289>



# SEED SET



Jing, S & Boelt, B. Seed production of red clover (*Trifolium pratense*L.) under Danish field conditions. *Agriculture* 2021, 11, 1289.

<https://doi.org/10.3390/agriculture11121289>



# POLLINATION STUDIES



*Bombus pascuorum*  
Scopoli



*Bombus hortorum* L.

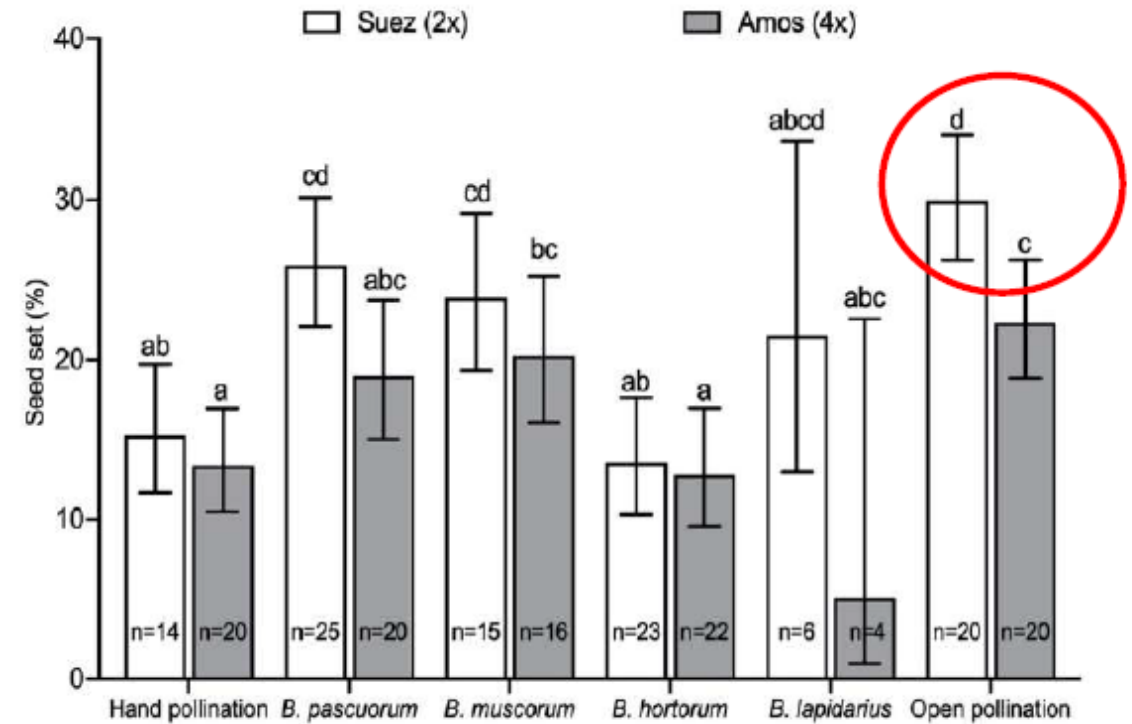
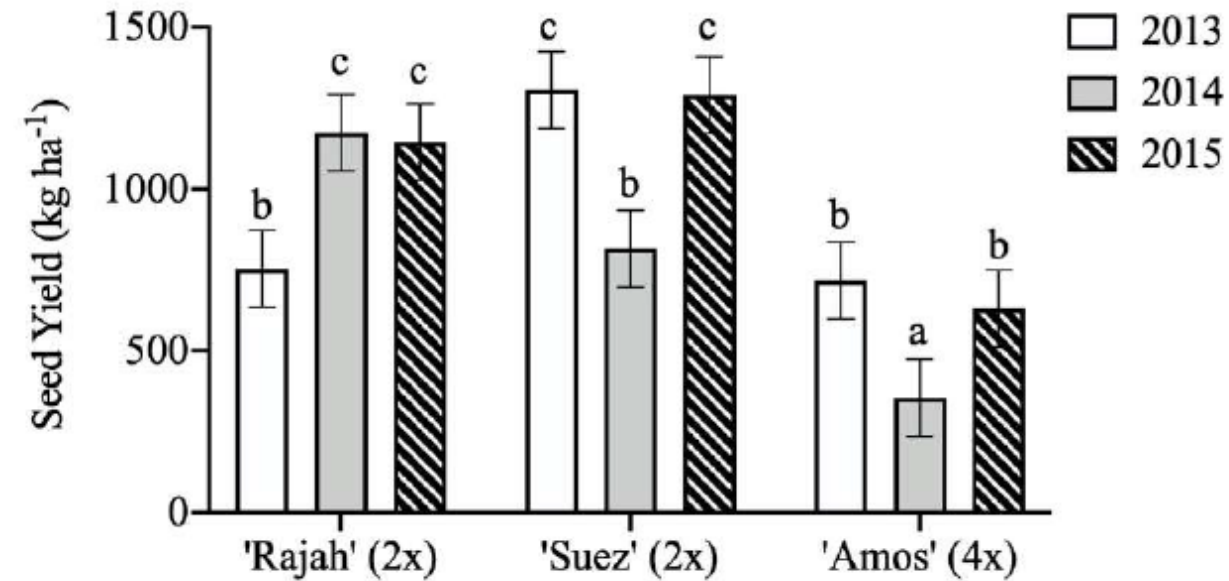


*Bombus muscorum* L.



*Bombus lapidarius* L.

# SEED YIELD AND POLLINATION



# CONCLUSION

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- The lower seed yield in the tetraploid red clover cultivar, Amos compared to the diploid Suez was explained by a lower seed set
- Type of pollination (by hand, different bumble bee species or open pollination) could not explain this difference
- Within each cultivar there was a high variation in the number of seed per flowerhead
- Breeders should focus more on the reproductive success in red clover in particular in the tetraploid varieties
- Seed growers and advisors should pay more attention to optimise pollination

# REDCLOVERSEED PRODUCTION AND YIELD IN OUR COUNTRIES

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- **Oregon:** 5.250 – 7.500 ha, almost all diploid, yield dryland 840 kg/ha; irrigated 1120 kg/ha
- **France:** 3.000 – 9.000 ha, 80% diploid; yield 200-300 kg/ha; best years 600 kg/ha
- **Sweden:** 2.500 ha, 50% organic; 55% diploid yield 340 kg/ha; tetraploid 250 kg/ha
- **New Zealand:** 1.000 ha; 95% diploid; yield 375 kg/ha
- **Norway:** 325 ha; 94% diploid yield 361 kg/ha; tetraploid 158 kg/ha



# THANK YOU FOR YOUR ATTENTION

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René Gislum

And red clover colleagues





AARHUS  
UNIVERSITY