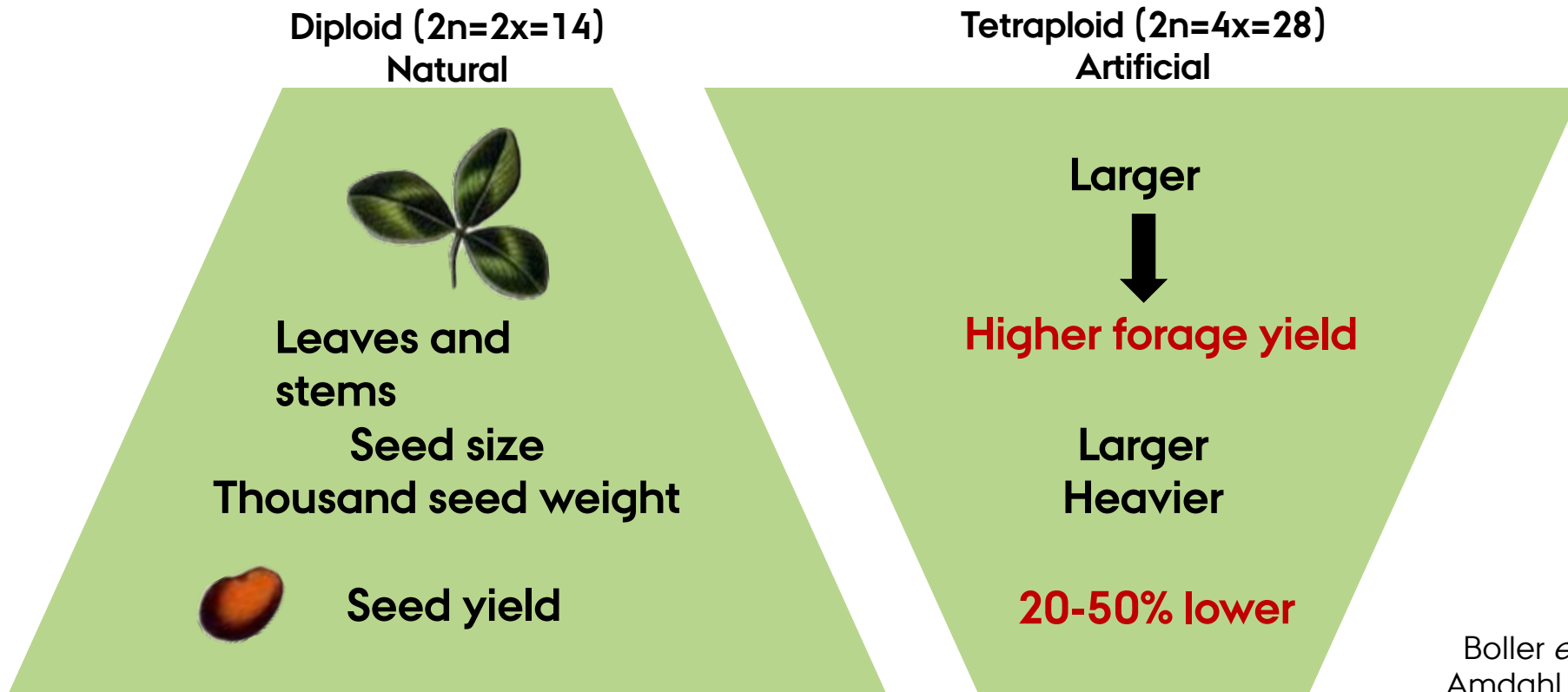


POLLINATION OF RED CLOVER FOR SEED PRODUCTION



DIPLOID vs TETRAPLOID



Boller *et al.* 2010
Amdahl *et al.* 2017

POLLINATION

80-90% of red clover seed yield rely on bees → 7200-8100 dkk/ha Axelsen *et al.* 2011



Source: Pollen



Vector: Pollinator



Recipient: Stigma

POLLINATOR



Apis mellifera



Bombus terrestris agg.



Bombus lapidarius



Bombus hortorum



Bombus pascuorum

Tongue length: Short

Short

Intermediate

Long

Long

Bumble bee abundance:

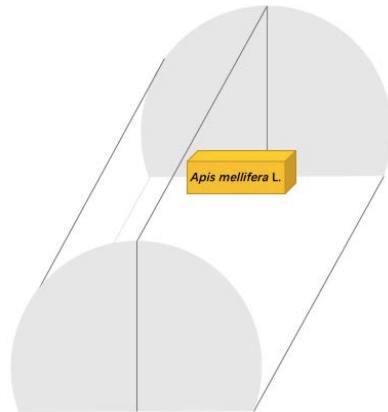
(historic shifts)

Bommarco *et al.* 2012



POTENTIAL OF HONEY BEE

- Cage study: Pollination experiment 2016 & 2017
- Cultivar: Rajah (2n), Amos (4n)
- **Pollination behaviour and Seed set**



One-bee treatment

(9 a.m.– 9:02 a.m.)



Two-bee treatment
2nd bee (9:15 a.m.– 9:16 a.m.)
1st bee (9:10 a.m.– 9:12 a.m.)



Open-pollination treatment

(9 a.m.– 11 a.m.)



*** Hand-pollination treatment in 2017**

HIGHLIGHTS

- Tetraploid was as attractive as diploid red clover for honey bees in cage study.
- Seed set of tetraploid red clover was lower than diploid red clover.
- Honey bees may re-visit the florets and this can result in lower seed set, in cage study.

HOW MANY BEEHIVES DO WE NEED?



➤ **Raspberry example** *Sáez et al. 2014*



80% styles were damaged with high bee visitation rates.

(~300 visits flower⁻¹ day⁻¹)

30% fewer drupelets compared to low bee visitation rates.

(~ 4 visits flower⁻¹ day⁻¹)

➤ In Denmark, **4-5 colonies ha⁻¹** of honey bees recommended for red clover seed production.

” **Breeding programs aimed to improve the
attractiveness of forage legumes for
pollinators and the floret fertility seems to
be overlooked.**

- Boelt *et al.* 2015



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