

Seed size, establishment and yield

Larger canola seed has fewer seeds per kilogram, but higher establishment rates offset this difference. At a consistent sowing rate, plant populations remain similar across seed sizes. Larger seed has potential to deliver yield advantages.



Background

Canola planting seed size varies between seasons due to environmental conditions during seed production. Sometimes it is assumed larger seed means higher sowing costs, but this overlooks differences in field establishment between seed sizes.

In 2024, Pacific Seeds conducted replicated trials across 14 Australian environments examining the relationship between seed size, sowing depth, and plant establishment.

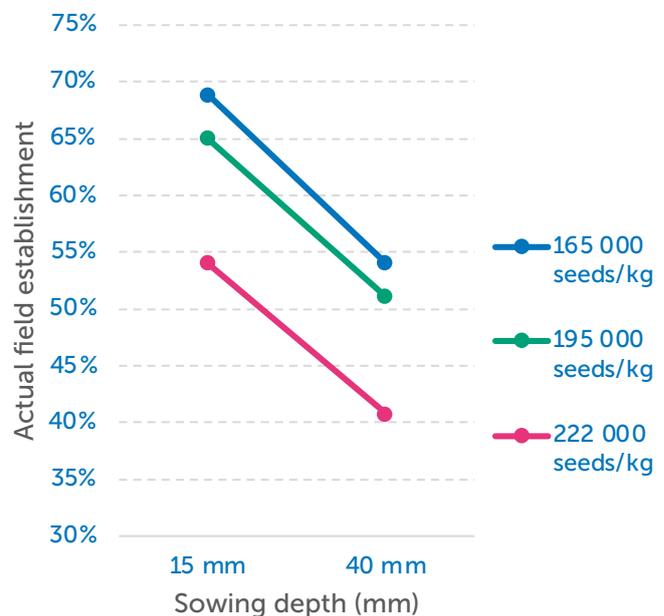
Establishment

Larger seed (165k seeds/kg) consistently achieved higher field establishment than smaller seed (222k seeds/kg) across both normal (15 mm) and deep (40 mm) sowing depths.

Why does larger seed establish better?

- Larger seeds contain greater energy reserves (lipids, proteins, starches) to fuel germination before the seedling can photosynthesise. This results in faster germination, stronger early growth and improved seedling vigour.
- This is advantageous under challenging conditions such as dry starts, deep sowing or variable soil temperatures.
- Larger cotyledons and early leaves can contribute to faster ground cover, potentially improving weed competition and reducing insect pressure.

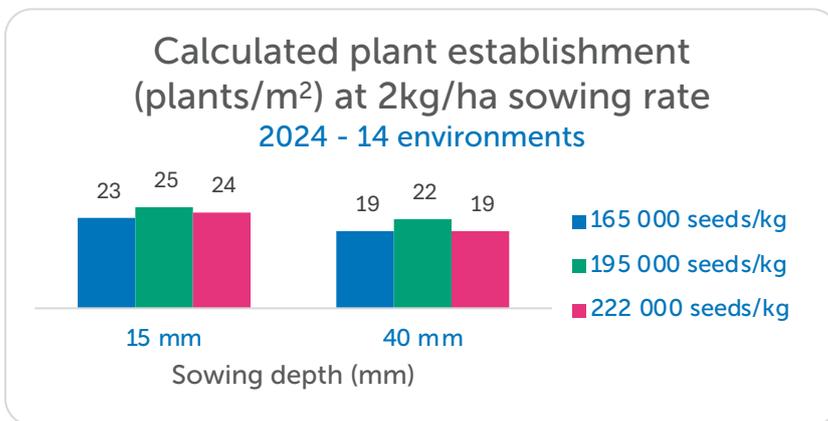
Field establishment for varying seed size and sowing depth
2024 - 14 environments



Key point: Larger seed compensates for lower seed counts through better establishment, resulting in similar plant populations at the same sowing rate.

Sowing rate implications

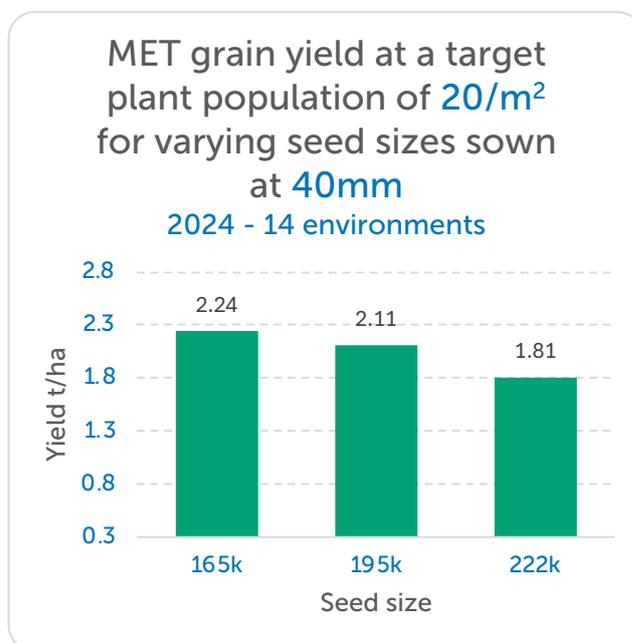
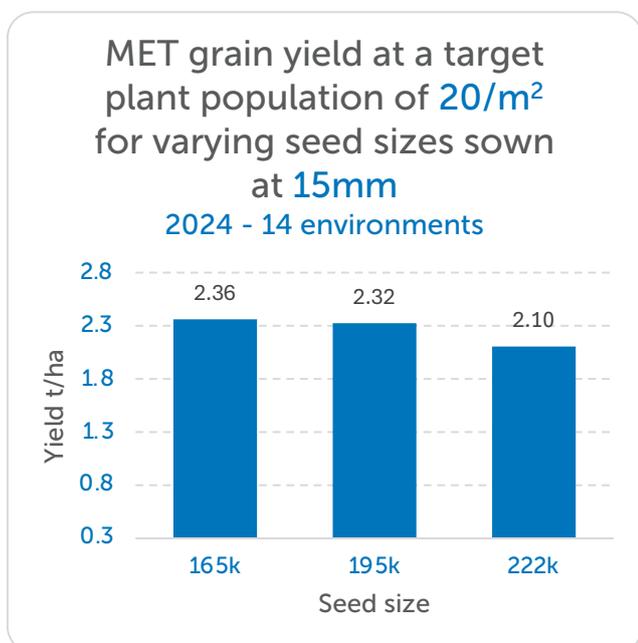
Growers may maintain a consistent sowing rate regardless of seed size. Applying the establishment percentages from the 2024 study to a 2 kg/ha sowing rate, final plant populations remain relatively consistent across seed sizes.



Yield

Environment and genetics remain the primary drivers of yield. However, the 2024 study found larger seed delivered higher yields than smaller seed. This yield advantage was greater under deep sowing conditions, where smaller seed is disproportionately affected.

There was no significant yield difference between 165k and 195k seed at the higher population and normal depth. The 222k seed showed significantly lower yields, particularly at reduced populations or when sown at depth.



Summary

- Larger seed achieves higher establishment rates than smaller seed
- At a consistent sowing rate, this offsets the lower seed count, resulting in similar plant populations
- Larger seed may deliver yield advantages, particularly under deeper sowing conditions

Source: Heinrich AS & Liddle WA (2024) Agronomic and value equation outcomes associated with a matrix of different canola seed sizes by plant populations by seeding depth.

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