

Canola seeds studied for superior strains

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“Early vigour is important for the crop plant to establish and combat with all kinds of biotic and abiotic stresses including weeds and insects,” Prof Yan says.
Credit: Jan Smith

UWA scientists are hoping a better molecular understanding of canola (*Brassica napus* L.) seed germination will enable them to breed superior cultivars, following research into strains that demonstrate contrasting

germination speeds.

For approximately one year the researchers evaluated 137 canola accessions, or strains for germination speed in a project led by UWA School of Plant Biology Professor Guijun Yan.

They studied the seeds which were placed on Petri dishes filled with filter paper and were soaked with five millimetres of deionised water and maintained in an incubator in the dark at 25 degrees Celsius.

They used ten seeds of each accession, with the number of germinated seeds recorded after eight hours and then every two hours for one day.

The accessions were grouped into three categories, fast (F), medium (M), and slow (S) to measure the vigour and growth of each.

In repeated experiments they identified, nine category F (seven per cent) and 12 category S (nine per cent) germination strains.

Although accessions in category F showed significantly faster germination and emergence than those in category S, seedling growth parameters did not differ greatly.

Prof Yan says the results may be due to the measurements they took and the overall statistics and that as the plants grow the difference may become more eminent.

Early seed growth needed to overcome stresses

The researchers identified four accessions with high early vigour and four with low early vigour based on germination speed and seedling characteristics.

They then determined combining germination speed and seedling vigour index would be reliable for evaluating early vigour.

"Early vigour is important for the crop plant to establish and combat with all kinds of biotic and abiotic stresses including weeds and insects," Prof Yan says.

"Fast germination and quick accumulation of dry matter [seedling vigour index] are the two parameters to show that plants can grow faster than weeds and to stand for other stresses.

"We are making crosses between fast and slow genotypes to produce segregating populations to study the inheritance of early vigour."

Prof Yan says subsequent fine mapping and molecular marker development will eventually help them understand the genes responsible for early vigour.

He says identified accessions with early vigour are being crossed with industry elite cultivars to introgress traits to create cultivars with early vigour that farmers can use.

More information: "Identification of fast and slow germination accessions of *Brassica napus* L. for genetic studies and breeding for early vigour." *Crop and Pasture Science* 66(5) 481-491
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