

## Slow-maturing wheats improve yield, profit and flexibility

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Slow-maturing wheat varieties are emerging as a means of improving the flexibility, and profitability, of cropping programs, CSIRO Research Scientist James Hunt told the recent GRDC Update in Adelaide.

Given the need to sow early and the current high level of climate variability, including less April-May rainfall, it is important to take advantage of every seeding opportunity from late summer onward, he said, and sowing a slow-maturing variety early can greatly increase whole-farm yield.

“Crops need to be sown on time or early if they are to flower at the optimal time and maximise yield and water use efficiency.

“The ideal flowering time is a product of temperature, radiation, water availability, frost risk and heat risk and the key for growers wanting to maximise whole-farm yield is to have as much of their wheat as possible flowering during the optimal period for their district.”

Well-adapted slow-maturing wheats can help achieve that, he said, and trial results and field experience show that early-sown well-adapted slow-maturing winter and spring varieties yield as well or better than faster-maturing varieties.

Results from a Mid North trial, in which



SOWING SLOW-MATURING VARIETIES ON EARLY MOISTURE CAN IMPROVE THE CHANCES OF GROWING CROPS LIKE THIS MORE OFTEN AND IMPROVE WHOLE-FARM PROFITABILITY.



JAMES HUNT CHECKING DEVELOPMENT OF AN EARLY-SOWN WHEAT CROP.

slow-maturing breeding lines sown early yielded more than mid to fast-maturing lines sown later, suggest longer-season varieties could have a role in SA, but none of the currently available winter wheat varieties is suitable for use in SA districts other than the South-East.

“MacKellar, Revenue and Manning varieties are all well adapted to South-East conditions but there are currently no slow-maturing winter wheat varieties suitable for other SA districts,” Dr Hunt said.

“However, it is possible to sow well-adapted mid-maturing spring wheat varieties early and use well-timed and managed grazing to delay maturity of early-sown spring wheats so they flower in or close to the ideal window.

“SA growers in regions other than the South East who want to explore the benefits of sowing wheat on moisture available earlier than accepted seeding period could try a well-adapted, faster-maturing spring wheat such as Trojan or Mace instead of a winter wheat and use grazing to slow its development.”

Winter wheats can be sown very early without sacrificing yield potential because they remain in the vegetative growth phase until they are exposed to a genetically pre-determined level of chilling that is needed to initiate reproductive development.

This means it is possible, in the right conditions, to sow a winter wheat as early as February and still have it flower at the ideal time.

Early sowing of slow-maturing varieties has been taken up as a risk management strategy in southern NSW, where many growers with stock are using them for grazing during their extended vegetative phase, before the paddocks are 'shut up' for grain, Dr Hunt said.

This has led to these varieties being characterised as 'dual purpose', although grazing is not required for their management.

Frost is a significant sowing-time concern for many growers but appears to be less of an issue than is sometimes feared, Dr Hunt said.

"Delaying sowing to delay flowering is not an effective way of managing late-season frost risk.

"In the black frost in southern NSW and Victoria in October last year all crops, whether sown too early, too late or on time, suffered around 60% frost damage but yield still declined with flowering date, with late-sown varieties yielding less than varieties that flowered on time or early.

"This clearly shows that delaying sowing past the optimal date for a particular variety is not an effective way of managing frost risk and historically, late sowing has probably cost more yield than frost.

"Research data show that the highest yielding crops typically sustain up to 10% frost damage at flowering, so growers not getting 10% frost damage are not trying hard enough and could benefit from re-thinking seeding-time scheduling and strategies."



GROWERS WANTING TO CAPITALISE ON EARLY SOWING OPPORTUNITIES NEED TO HAVE SEEDING EQUIPMENT READY TO GO AND HAVE SEVERAL VARIETIES ON HAND THAT WILL FLOWER AT THE OPTIMAL FLOWERING PERIOD FROM DIFFERENT SOWING DATES.

## USE THE MOISTURE AVAILABLE

April-May rainfall has declined significantly in the past 17 years but February-March rainfall has not declined and in some areas has increased, according to CSIRO scientist Dr James Hunt.

He advocates that growers capitalise on that pattern and make direct use of early moisture when it is available by sowing slow-maturing wheat varieties.

'Getting ahead' on seeding by sowing slow-maturing wheat varieties well before the usual sowing window eases sowing-time pressures and increases the likelihood of being able to sow quicker-maturing short-season varieties at the ideal time for them, he said.

"Most recently-released wheat varieties have a very narrow range of maturities and unstable flowering times and flower during the optimal period only if sown between late April and late May.

"Slow-maturing winter wheat varieties tolerate a range of very early sowing times because they rely on a period of chilling to trigger tillering, which ensures they flower and set grain at the ideal time, provided they are well-adapted to the district in which they are being grown."

This capability was demonstrated at Birchip last year in BCG trials funded by Grain and Graze II in which a selection of varieties was sown on February 26 after 50 mm of rain.

The winter lines emerged, survived a hot, dry autumn with no rain and regenerated rapidly when rain came in late May. They subsequently flowered at the optimal period for the Birchip area and the best of them yielded about 3.4 t/ha; as much as the fast-maturing commercial control variety sown in the accepted 'right' seeding time in May.

While this illustrated the flexibility of slow-maturing varieties in this environment, the yield potential of winter wheats in the Victorian Mallee is probably maximised by seeding from early April on, although this may change if it is intended to graze the wheat as part of the management program, he said.

Growers wanting to explore the benefits of early sowing need to have a clear idea of their optimal flowering period and how to achieve that from different sowing dates with a range of varieties suited to

their environment, he said.

They also need to position themselves to take advantage of early sowing opportunities by identifying paddocks that are relatively free of weeds and diseases so they know what paddocks to target if there is an early sowing opportunity.

"A double break such as a legume or hay crop followed by canola is an ideal set up for early-sown wheat."

He also suggests growers keep a winter wheat, where adapted varieties are available, and one or two spring varieties on hand so they can take advantage of any early sowing opportunity that arises.

They may also need to be more aware of disease risk.

"Early-sown wheat can face higher disease pressure, particularly in higher-rainfall areas, and growers sowing wheat early may need to consider fungicide seed treatments and in-furrow and in-crop fungicide applications depending on the variety and the conditions."

