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In this issue of Crop Action:

- [General: Soil sampling and tricks](#)
- [Cereals: Aphid monitoring, Does my wheat need a T0 fungicide?](#)
- [Herbage: Spring nitrogen on ryegrass seed crops](#)
- [Maize: Soil testing before maize planting, Winter cover crop termination](#)
- [Oilseed rape: Application of spring fertiliser](#)
- [Weather updates: Long-term climate outlook, FAR weather tool and soil moisture data](#)

Editor's note

The weather is always a big part of the discussion whenever arable farmers are considering the future (long or short term), and in springtime this tends to count double, as there is always so much going on, from sowing of spring crops to [management of aphids](#), weeds and [diseases](#). However, this year has another layer of complication, as we prepare for what we are told will be an historically severe El Niño event. You may have caught [this recent article](#) where Hugh Ritchie discusses his contingency plans for the season. It's worth a read.

Crop management

General

Soil sampling tips and tricks

Factoring in soil N supply to reach targeted yield can reduce fertiliser use and cut costs. FAR trial results repeatedly show savings between \$200- \$250/ha. And as the cost of urea goes up, these numbers go up too. To find out how much plant-available nitrogen (N) is in your soil after winter, you'll need a **soil mineral N test**; either from a lab or using a DIY quick N test ([here](#)). To start with, you might like to check out this video from FAR's Dirk Wallace showing you [how to take a soil sample](#). To help work through this process a good place to start is Arable extra issue 143: N Smart ([here](#)). You can then progress to [how to use the soil N supply calculator](#).

If you also want to estimate how much extra N your soil will release during the growing season, add a **potentially mineralisable N (PMN) test**. PMN can be done any time of year and doesn't need to be repeated every year.

Tip: Only measure PMN in the **top 0–15 cm or 0–30 cm** of soil – no deeper.

Whether you're using just mineral N, or both mineral N and PMN results, FAR's **Soil Nitrogen Supply Calculator** ([here](#)) can help you work out the right fertiliser rate to hit your target yield.

Example: For a 12 t/ha wheat crop, the calculator works out how much fertiliser N (kg/ha) to apply based on your total N requirement and your soil's N supply.

If you're including PMN, you'll also enter the crop's active growing months (so only the N it will use is counted) and whether irrigation is used (which affects mineralisation rate).

Soil Analysis Results		
Sample Name:	Yard Paddock 0-30cm	
Sample Date:	03-Aug-2023	
Lab Number:	3336147.3	
Sample Type:	SOIL Arable	
Sample Type Code:	S56	
Volume Weight	g/mL	0.93
Ammonium-N*	mg/kg	< 1
Nitrate-N*	mg/kg	4
Mineral N (sum)*	mg/kg	5
Hot Water Extractable Organic Nitrogen*	mg/kg	112
Potentially Mineralisable Nitrogen*	mg/kg	110

* Paddock ID: Yard Paddock
 * Sampling date: 3/08/2023
 * Sampling depth (cm) - 1: 0-30cm
 Soil depth 2:
 Soil Type:
 * Bulk Density - depth 1: 1.20
 Bulk Density - depth 2:
 * Climate Region: Canterbury (Lincoln)
 Estimated total crop N demand: 300 (kg N/ha)

Soil Test Results

Soil mineral N - What you've got

	Lab Results - Min N (mg/kg)	Min N (Kg/ha)
Sampling depth 1	5	18
Sampling depth 2		0
Total Min N		18

Use a Quick N result instead: Sampling depth 1: No
Sampling depth 2:

Potentially mineralisable N - What you might get

	Lab Results - PMN (mg/kg)	
Sampling depth 1	110	0-30cm
Sampling depth 2		0

Growers wanting to sense check these numbers on-farm have been trialing low or no N applications on small areas of paddocks (as small as you want) to check how crops perform without fertiliser N. On-farm try outs like these can help you to build knowledge and confidence around how to incorporate soil nitrogen estimates into crop nutrient planning.

More information can be found in FAR's publication, [Nitrogen: the confidence to cut back](#). You can also find some more maize-specific information like this [later in this publication](#).

Cereals

Aphid monitoring

There have been some unseasonably warm days in Canterbury over the past couple of weeks (and some very cold ones, too), but aphid numbers at all FAR's monitoring sites have not indicated any sign yet of aphid flights beginning. These normally don't happen in significant numbers in Canterbury until October, but with the experience of last year, as well as the complicating effect of El Niño, growers are advised to keep an eye on [Aphid Chat](#) for the latest on this topic.

Many growers chose to apply an autumn foliar insecticide this season; in these cases, aphid build-up and spread within the crop should be limited until aphid flights begin in earnest. The presence of beneficial insects (especially parasitic wasps) will also help delay the build-up of aphid numbers until the crop is big enough to not be affected too much by aphid-borne viruses.

Autumn-sown crops that didn't receive a foliar insecticide before winter could be in a different boat. The warm June experienced through most of the South Island could have led to aphid colonies establishing in crops, which then are ready to start reproducing and spreading once the weather gets

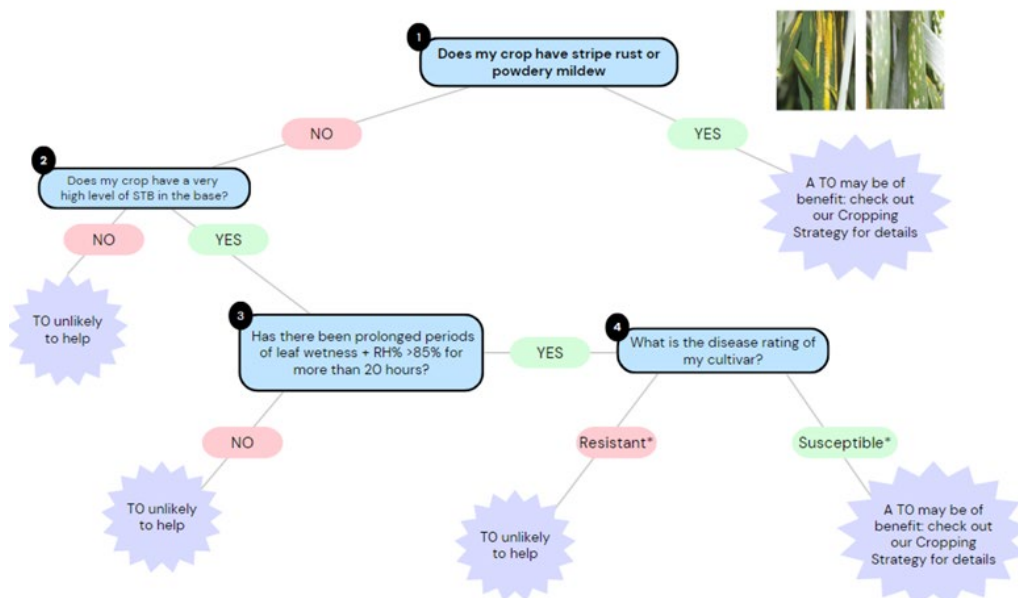
warm enough in spring. If an insecticide is needed in this case, timing is crucial, as you want to make sure that aphids are out on the crop. Choice of insecticide is important, too, so that beneficial insects are protected as much as possible.

Does my wheat need a T0 fungicide?

The end of winter has been relatively warm, and with enough moisture around, some growers may be considering an early fungicide. There may also be some growers worried about a possible windy season ahead, that could make later spraying difficult.

T0 fungicides (applied around Growth Stage GS30-31) are rarely economically justifiable, with FAR trials repeatedly giving Margin-over-Cost (MoC) results that favour skipping the T0 spray ([see Arable Update 231](#)). There can be some situations where a T0 is justified, namely if stripe rust or powdery mildew is present, but in most situations the natural resistance of the cultivar should be what gets you through to the T1 timing (GS32). FAR has produced a decision tree to assist with planning, which is reproduced below. For a more detailed breakdown of your options, refer to [Arable Update 219](#). The Cropping Strategy publication can be found [here](#).

Will I benefit from a T0?



Fungicide resistance

Remember also that there is another compelling reason not to use a fungicide unless you need to: fungicide resistance. The more times a disease population is exposed to a given active ingredient, the more chances it has for resistance to develop further. Many fungicides limit the number of times it can be used per season (including seed coatings), so being mindful of this is an important aspect of preserving our valuable fungicide chemistry for future efficacy.

Herbage

Spring nitrogen on ryegrass seed crops

[Spring nitrogen requirements for ryegrass seed crops](#) are generally set at about 175 kg N/ha, minus however much may be supplied by the soil throughout the season (often estimated at about 20-30 kg N/ha). Some growers have asked whether this holds true for newer cultivars, many of which produce significantly more vegetative tillers. The assumption could be that this would mean an extra requirement for nitrogen and certainly, these crops can look hungrier in spring and it can be tempting to add more N. However, at this stage, we just don't know.

Information to date suggests that N timing may be more important than N rate. This makes sense given FAR research suggests that earlier closing dates can raise seed yield (see below); but it's a balancing act: encouraging good growth for later partitioning into the seed without pushing an increase in late vegetative growth that will reduce seed yield. Our recommendation is to contact your seed company to discuss a strategy.

FAR research

In the meantime, FAR is in the final year of a three-year study on improving seed yield of the so-called "low aftermath heading" varieties, which produce more vegetative tillers, especially after the usual harvest window has concluded.

The first year of the study (yet to be published) showed that keeping the crop grazed (or topped) through late winter and up until closing was important. Early closing dates yielded much better than late ones, as long as lodging wasn't an issue. The risk with adding extra nitrogen to compensate for extra tillering is that it could increase lodging, which decreases seed yield.

The second year's trial investigated whether the early closing could be compensated for with higher PGR rates. This time, early closing had no effect on yield. PGR rate also had no effect on yield, except at very low rates, which led to the lowest yields in the trial (unsurprisingly).

Partly due to the uncertainty around these second-year results, the trial is being repeated this season, with some adjustments.

Maize

Soil testing before maize planting

With the maize season rapidly approaching, now is the time to think about crop nitrogen (N) requirements and, importantly, measure how much N your soil can supply. N supplied by the soil is the cheapest N available. **Plan to use it or lose it.**

Fertiliser N is typically either applied prior to planting (all up front) or split into a planting application and a side-dress application. Soil testing can be used to adjust fertiliser rates for either of these approaches. Further information on soil sampling can be found [above](#), including testing for potentially mineralizable nitrogen (PMN).

Some maize-specific considerations:

- Sampling the top 30cm of soil is ideal, but down to 15cm will suffice. A 15cm sample often underestimates the available N.
- Sample two-three weeks before application is planned.
- When sampling after planting, sample between the rows to avoid any N applied at planting.

Mineralisation is carried out by soil microbes as they break down organic matter, releasing N that can be taken up by the maize crop. Microbial activity is driven largely by soil temperature and moisture, so N release varies throughout the growing season.

Mineral N can change considerably with rainfall and other conditions, making the timing of soil testing important. PMN is much more stable and, once soils have been cropped for two years or more, generally only needs to be measured every three years.

Even on old, long-term cropped soils there can be worthwhile savings. At a long-term cropped FAR research site, mineralisation can still contribute more than 50 kg N/ha during the maize growing season, worth approximately \$140/ha at current Sustain[®] prices. A mineral N test shortly before side-dressing, following annual ryegrass, identified a further contribution of more than 80 kg N/ha. Together, the soil could supply more than 130 kg N/ha. These figures are from the lowest soil N-supplying treatments at the site, so provide a deliberately conservative example.

Winter cover crop termination

Winter crop termination prior to maize planting is approaching. If you intend to cultivate, make sure there is enough time between termination and cultivation to ensure winter crop roots break down enough to achieve a good seed bed for planting maize. If the winter crop is retained rather than harvested e.g. for weed suppression (see weed FAR Focus [here](#)), heavy residue can create challenges at planting in no-till systems. A thick “mat” may hinder seedling emergence, and residue can ‘hair-pin’ in seed trenches, reducing slot closure and seed-to-soil contact. If you intend to no-till plant in these conditions, ensure your row cleaners are set up to handle the planting environment.

Termination timing

There are pros and cons to different termination timings. The results from five years of trials (2017-2022) in a no tillage system, where residue was retained for integrated weed management and termination timing ranged from 3 to 34 days before planting, highlighted the following:

Pros of earlier termination

- Significantly stronger early season maize growth, regardless of winter crop.
 - This was not driven by nitrogen (N) availability as the maize did not start utilising soil N until 3–5 weeks after planting. Lower soil temperatures with the later termination timings may be important.
- A ‘brown bridge’ period may help minimise insect populations and risk.
- Early termination supported root breakdown, which in turn, is likely to support more effective cultivation.

Pros of later termination

- Greater biomass over winter and living root days.
- Despite slower establishment, in most years the maize caught up and yields were not significantly reduced.

- However, in dryer years, there was a trend for lower maize silage and grain yields the closer the termination timing was to maize planting (possibly due to moisture competition).
- Overall, where there were winter legume crops there were greater maize yields despite termination timing (and less N fertiliser was required).

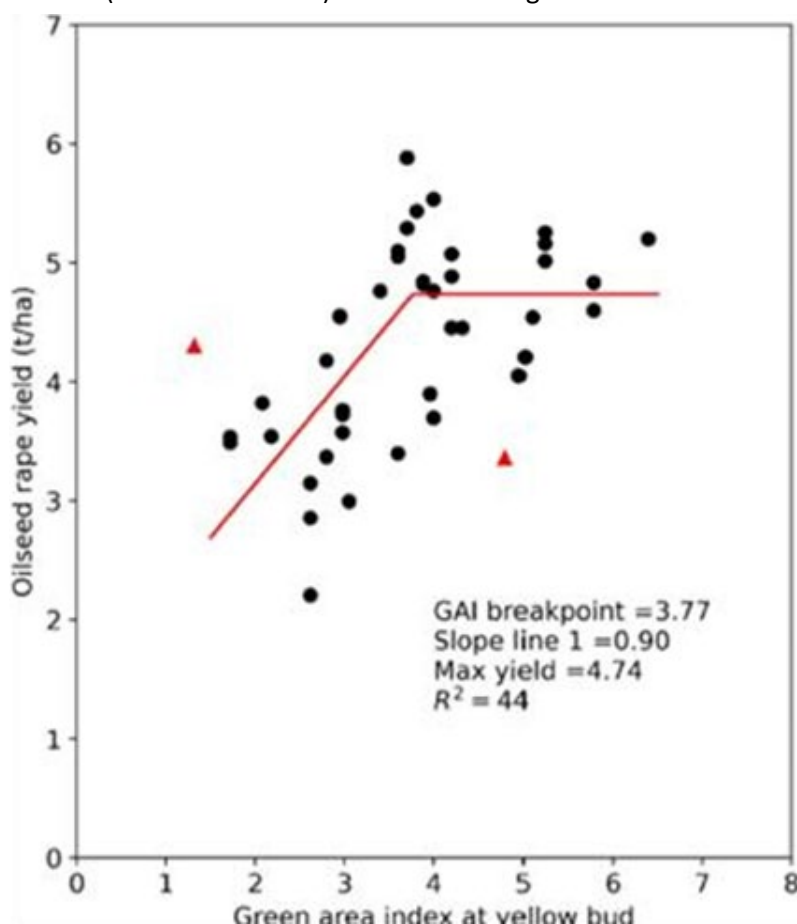
Find out more about cover crops [here](#). You also might like to check out the booklet from FAR's recent maize winter workshops, [here](#).

Oilseed rape

Application of spring fertiliser

Data from the ongoing South Canterbury Monitor Farm Study (MFS) supports the practice of aiming for a GAI of 3.5-4 by the beginning of flowering. To achieve that, an application of spring N should be going on in the next couple of weeks. This timing of N application is more important than the amount, with peak demand for N coinciding with stem extension and green-yellow bud. The target GAI at early stem extension is 1.0-1.5, so if the crop is behind this, early N would be advised. Some other considerations are:

- When possible, apply fertiliser right before forecast rain to ensure rapid transfer to the root zone.
- Crops also require sulphur (S) at this time.
- **Figure 1:** Analysis of MFS data across multiple years demonstrates a yield breakpoint at GAI (Green Area Index) 3.77 at flowering.



Weather Updates

Long-term climate outlook

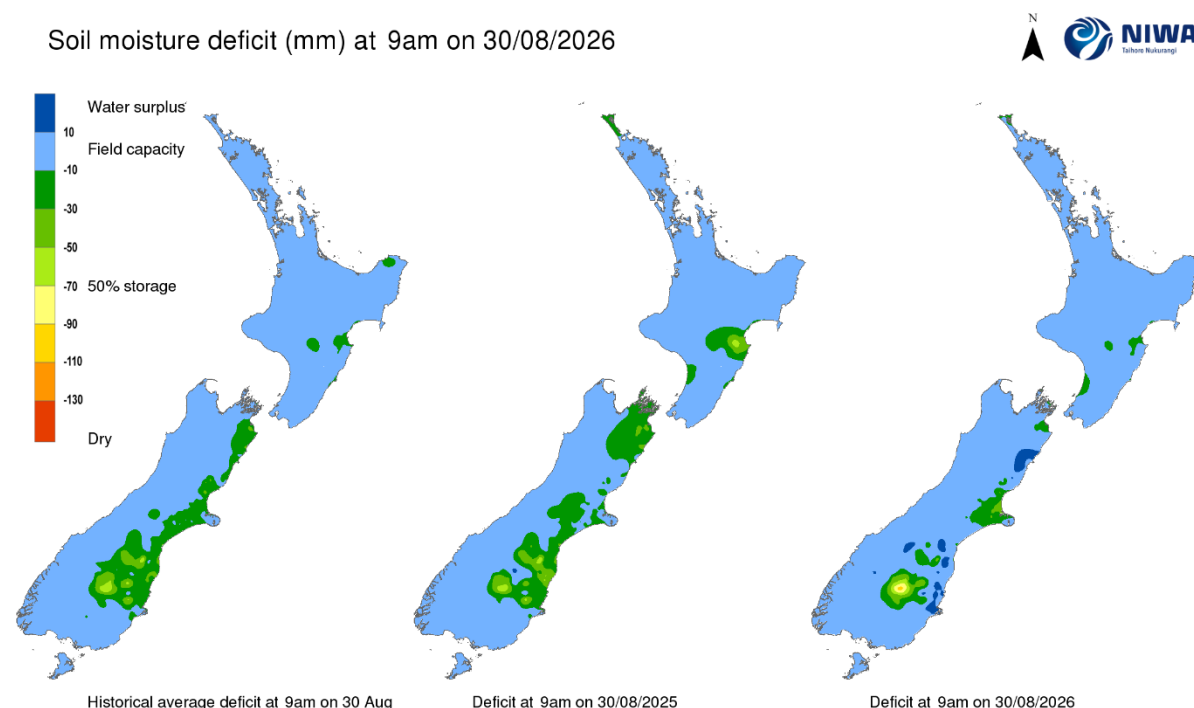
According to [Earth Sciences New Zealand](#), El Niño conditions have continued to strengthen and are expected to be the dominant driver of climatic conditions over the next three months. Westerly air flows will prevail (with some south-westerly flows from October), and temperatures will be near average or above average. However, there will be a lot of variability throughout spring, with cold snaps expected from time to time. Rainfall totals over the next three months are expected to be either average or below average, except for the north and east of the North Island, which should plan for below average rainfall. The south and west of New Zealand is likely to experience high rainfall events. Below normal rainfall for various regions through winter has led to reduced groundwater recharge. During spring, many of these regions are likely to experience reduced rainfall, more frequent dry spells, and enhanced drying of soils and vegetation, creating challenges for water-reliant sectors.

For more on what looks likely to be one of the strongest El Niño events on record, click [here](#).

FAR weather tool

The FAR online weather tool is a great way to track weather patterns and to compare the current season's conditions with those of previous years. There are also a number of tools available to help with predicting disease and pest pressure. You can check it out [here](#). Click on the link and select the weather station closest to you from the drop-down box at the top right of the screen. Please contact us if you have any queries about the tool, or suggestions on how to make it better.

Soil moisture data: see more from Earth Sciences NZ [here](#).



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