Crop Action

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Editor's note

As soil temperatures rise and frosts become less frequent, the number of things demanding action on arable farms increase. We have a bumper issue of Crop Action for you this week, with a healthy number of articles covering many different crops. If we've missed an issue or a crop that you'd like advice or information about, please let us know! (Contact details are at the end of this publication.) Alternatively, skip over to the FAR website and Ask FAR[AI], simply type in our question and it will provide an answer in seconds.

Speaking of things that are ramping up, have you checked out FAR's YouTube channel? New videos on a range of arable topics are being posted regularly. Don't forget to like and subscribe!

Crop management

General

Beginning irrigation

Soil moisture levels have reduced a little over the past couple of weeks, but remain high relative to historical averages. Heavy rain events may have also topped up soil moisture somewhat. Nevertheless, some irrigators have been spotted running on the Canterbury Plains, and it won't be long before they become a more and more commonplace sight.

Knowing your soil type and water holding capacity (WHC) helps with decision making around when to start irrigating. Also feeding into this decision is knowing how long your irrigator takes to get around to where it started.

Another important consideration is how much to irrigate. If rain is forecast, it is good practice to leave 10-20 mm of soil capacity unfilled by the irrigator so that any rainfall is not "wasted". This also reduces the risk of nutrient leaching.

Useful resources:

- Recent "Cut the Crop" podcast – Making the most of irrigation.
- Bucket testing your irrigator.
- FAR Focus 4-Irrigation Management for cropping.
- FAR's moisture probe demo.

Getting the most out of soil test results

Mineral N (plant available N) is free, so including it in your fertiliser decision making can save you money. Mineral N is also highly mobile; so, if your crop doesn't use it, you're likely to lose it. Soil testing is the start of your fertiliser decision making process. Understanding your soil test results is the next step.

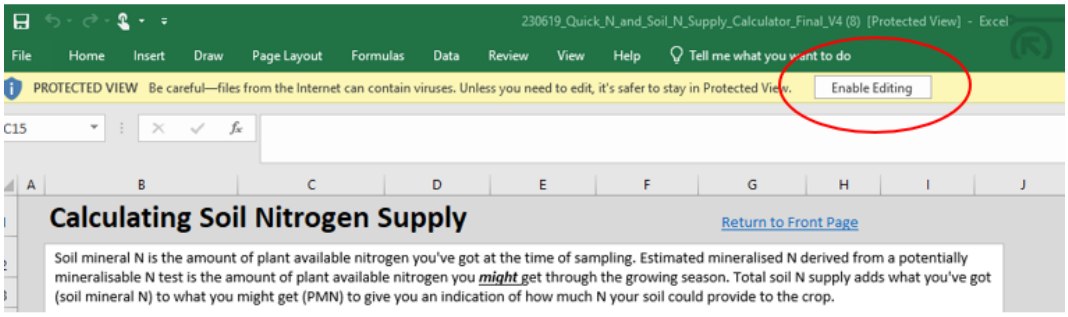
Over the next few months we will work through some real time examples to show;

a) how to use soil testing tools and FAR's N calculator to make fertiliser N decisions, and
b) how to use quick N testing as a simple way to measure N release over the season.

Download the soil N calculator from the FAR website (make sure you 'Enable Editing'):

https://www.far.org.nz/resources/soil-nitrogen-supply-calculator

Watch a step by step video on how to use the calculator here.



Working through an example:

Lab results will be in concentration e.g. mg/kg:

SOIL ANALYSIS

Core Length (cm)	Temperature on Receipt	Potentially mineralisable N	Nitrate-Nitrogen	NH4 Nitrogen	Mineral Nitrogen
	°C	mg/kg	mg/kg DM	mg/kg DM	mg/kg DM
30	<10	87	10.1	3.3	13.3
30	<10	64	10.4	4.1	14.5
30	<10	71	11.7	2.1	13.8

Info you will need for the N calculator to convert the concentrations received from the lab (mg/kg) into units you can work with (kg/ha):

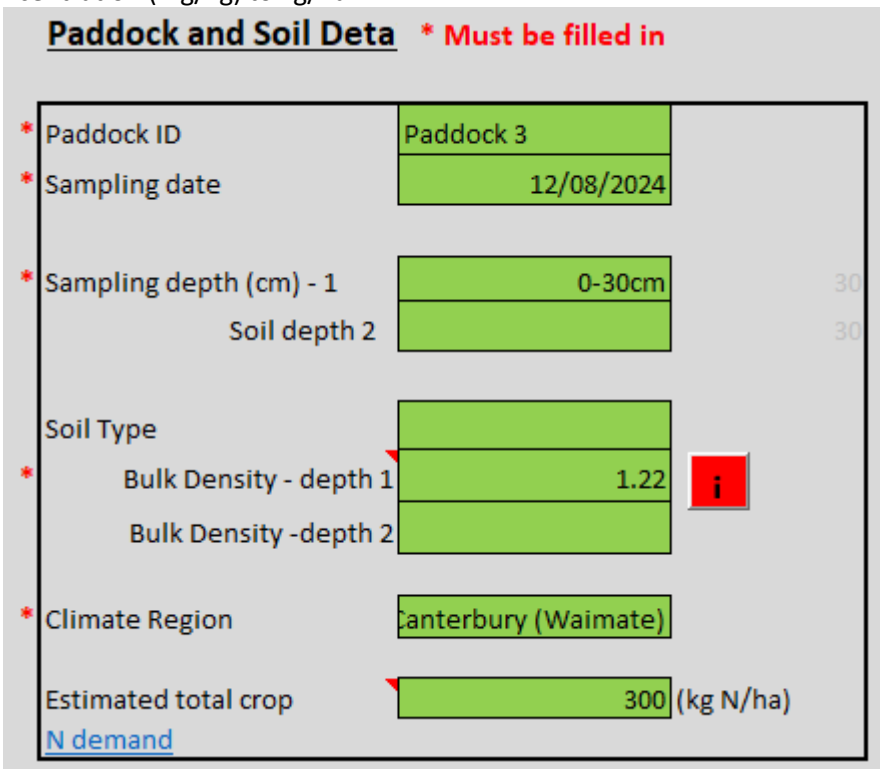
Date of sampling: 12 August 2024					From lab	From lab	From N calc	From N calc	From N calc
Depth of sampling	Paddock history, current crop	Expected yield (t/ha)	Approx. N used by crop for every t/ha	Total N required (kg/ha)	Mineral N (mg/kg)*	Potentially mineralisable N (mg/kg)**	Estimated Soil N supply (kg/ha)	Fertiliser N/ha required at 100% confidence in calculator	Fertiliser N/ha required at 70% confidence in calculator
Pdk 1, 30 cm	Summer rape, spring barley	9.5	25	237.5	13.3	87	128	109	148
Pdk 2,30 cm	Summer rape, autumn wheat	12	25	300	14.5	64	112	188	222
Pdk 3,30 cm	Multi species clover, autumn wheat	12	25	300	13.8	71	92	185	219
Pdk 4,30 cm	Balansa clover, spring radish	2	50	150	7.8	117	97	54	83

*Soil mineral N = how much plant-available N your plants have access to at the time of sampling.

** Potentially Mineralisable N (PMN) = the amount of N that will become available over the growing season.

Steps

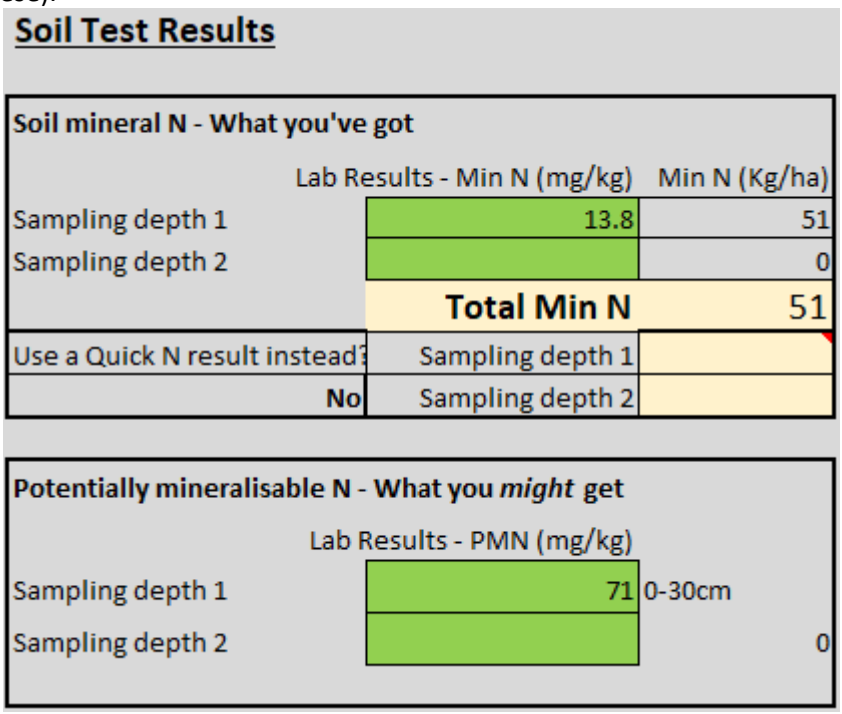
1. Enter the depth of sampling and select the climate region from the region that is closest to you from the drop-down box. Use the table to select a bulk density. These are required to convert concentration (mg/kg) to kg/ha.



Paddock and Soil Deta * Must be filled in

*	Paddock ID	Paddock 3	
*	Sampling date	12/08/2024	
*	Sampling depth (cm) - 1	0-30cm	30
	Soil depth 2		30
	Soil Type		
*	Bulk Density - depth 1	1.22	i
	Bulk Density -depth 2		
*	Climate Region	Canterbury (Waimate)	
	Estimated total crop N demand	300	(kg N/ha)

2. Enter the mineral N results from the lab (and the potentially mineralisable results if you have these).



Soil Test Results

Soil mineral N - What you've got

	Lab Results - Min N (mg/kg)	Min N (Kg/ha)
Sampling depth 1	13.8	51
Sampling depth 2		0
	Total Min N	51

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	71	0-30cm
Sampling depth 2		0

3. Enter the growing season (months when your crop will be actively taking up N) and if there is any irrigation during these months (in the 'Monthly calculations' and 'Estimate of mineralised N during

growing season' boxes). These boxes are important as we are only interested in the potentially mineralisable N that is made available while your crop is actively taking up N – typically September through until November or December.

Monthly Calculations

Irrigation (y/n)	Climate Factor	Month	1st Soil Depth 0-30cm	2nd Soil Depth 0	Monthly Total (kg/ha)
No	7.5	Sep	13.0	0.0	13.0
Yes	8.0	Oct	13.9	0.0	13.9
Yes	8.0	Nov	13.9	0.0	13.9
Yes	14.0	Dec	24.3	0.0	24.3
No	9.5	Jan	16.5	0.0	16.5
No	9.5	Feb	16.5	0.0	16.5
No	8.0	Mar	13.9	0.0	13.9
No	8.0	Apr	13.9	0.0	13.9
No	8.0	May	13.9	0.0	13.9
		Sub total	139	0	

Estimate of mineralised N during growing season (active crop N uptake)

Growing Season

Start Month: Sep *
End Month: Dec *

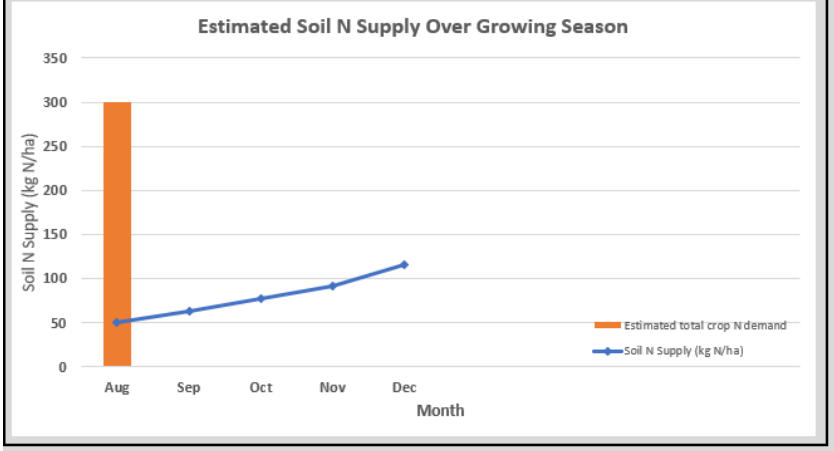
* Must be filled in

	Soil Depth 1	Soil Depth 2	Total	
	0-30cm	0		
Estm N Mineralised	65	0	**65**	kg/ha

4. Enter what % of soil N that you want to factor into the fertiliser requirement calculation ('Confidence factor').

Total Soil N Supply (kg N/ha)

What you've got	Soil mineral N available	51 kg N/ha	(A)
What you *might* get	Total estimated N mineralised in growing season	65 kg N/ha	(B)
	Total estimated soil N supply over growing season	**115 kg N/h**	(C) = (A+B)
What the crop needs		300 kg N/ha	(D)
Difference between crop need and estimated soil N supply		185 kg N/ha	(E) = (D - C)
"Confidence" factor (How much of the potential soil N supply estimate to inc		70 %	(F)
Revised fertiliser N requirement		219 kg N/ha	(G) = (D-(F/100)xC)
N fertiliser saving		81 kg N/ha	(D - G)



The calculator is designed to be used as a guide to support your decision making. As the season progresses we will be using quick N tests (that can be done on farm yourself) and comparing these to lab mineral N results to see how actual N release curves correlate to the calculator in these paddocks.

Cereals

Aphid management

The season so far is tracking about the same as last year, although there may be slightly less risk of aphid-vectored viruses than in 2024. South Island aphid monitoring confirms numbers are still low, as expected at this time of year, although a few isolated pockets of wingless aphids have been found in more advanced cereal crops. As the weather warms up, these colonies grow, and eventually winged aphids will form and secondary infestation will spread through the crop.

Depending on the season, if this secondary spread occurs before GS 32, foliar insecticides may be economically justified. However, the cold wind and experienced by most of the country last weekend will have reduced aphid numbers, and this, combined with a healthy population of beneficial insects means that cereal crops that reach GS 32 within the next month are unlikely to require an insecticide this spring. Later crops may benefit, but at this stage there are no indications that aphid numbers will reach levels required for a risk period.
Keep an eye on aphid numbers in your region and find valuable information on beneficial insects and insecticides at Aphid Chat, or check out this video on YouTube.

Disease management

Some autumn-sown cereals are now at, or nearing, T1 fungicide timing. The basis of disease control comes from fungicide applications at T1 and T2 (and T3, to a lesser extent), which protects the most important leaves that drive yield and give the most "bang for your buck". Some typical fungicide programmes used by FAR over the last three years are shown in Table 1.

Further information:

- Prioritising your cereal fungicide applications (a great YouTube video with FAR's Jo Drummond).
- Cereal Disease Management Strategy – Part 1
- Cereal update 220: Important diseases of wheat in New Zealand
- 2023 guidelines for the use of DMI-Triazole fungicides in wheat

Table 1: Prioritisation of FAR autumn sown wheat fungicide programmes and timings between 2021-22, 2022- 23 and 2023-24 in Mid Canterbury.

	Specific – Priority 3	Base Programme – Priority 1		Seasonal – Priority 2	Highly Specific – Priority 4
	GS 30-31 (T0)	GS 32 (T1)	GS 39 (T2)	GS 59 - 65 (T3)	GS 69-71 (T4)
2021-22	Opus® (1.0)	Kestrel® (1.0)	Elatus™ Plus (0.75) + Opus® (0.75)	Prosaro® (1.0)	Opus® (0.25) + Amistar® (0.25)
2022-23	Opus® (1.0)	Kestrel® (1.0)	Elatus™ Plus (0.75) + Opus® (0.75)	Prosaro® (1.0)	Opus® (0.25) + Amistar® (0.25)
2023-24	Bolide® (2.0)	Kestrel® (1.0) + Phoenix® (1.5)	Elatus™ Plus (0.75) + Revylution® (1.5) + Phoenix® (1.5)	Opus® (1.0) + Comet® (0.4)	Folicur® (0.44) + Amistar® (0.25)

Active ingredients: Amistar® (a.i. 250 g/L azoxystrobin, Group 11), Bolide® (a.i. 50 g/L epoxiconazole and 225 g/L prochloraz, Group 3); Comet® (a.i. 250 g/L pyraclostrobin, Group 11), Elatus™ Plus (a.i. 100 g/L benzovindiflupyr – SOLATENOL™, Group 7); Folicur® (a.i. 430 g/L tebuconazole, Group 3); Kestrel® (a.i. 160 g/L prothioconazole and 80 g/L tebuconazole, Group 3); Opus® (a.i. 125 g/L epoxiconazole, Group 3, Phoenix® (a.i. 500 k/kg folpet, Group M4); Prosaro® (a.i. 125 g/L prothioconazole and 125 g/L tebuconazole, Group 3); Revylution® (a.i. 100 g/L mefenitrifluconazole, Group 3).

Herbage

Managing new ryegrass cultivar closing dates

Many newer forage varieties of perennial ryegrass have been bred for forage quality through summer and unlike older varieties do not continue to produce reproductive tillers after the first spring flush of seed heads. This change in genetics means they must be managed differently in order to optimise seed yield.

FAR research into understanding the changes required is continuing, but in trials to date, the biggest seed yield gains have come from trial plots which have been hard grazed through late winter and spring up until closing, with early closing also possibly playing a role. Check out this video on the topic from FAR researcher Owen Gibson.

Spring nitrogen on ryegrass seed crops

Spring nitrogen requirements for ryegrass seed crops are generally set at about 175 kg N/ha, minus soil N 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. They want to know if the extra vegetation means an more N is required.

At this stage, we don't know for sure. Research 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

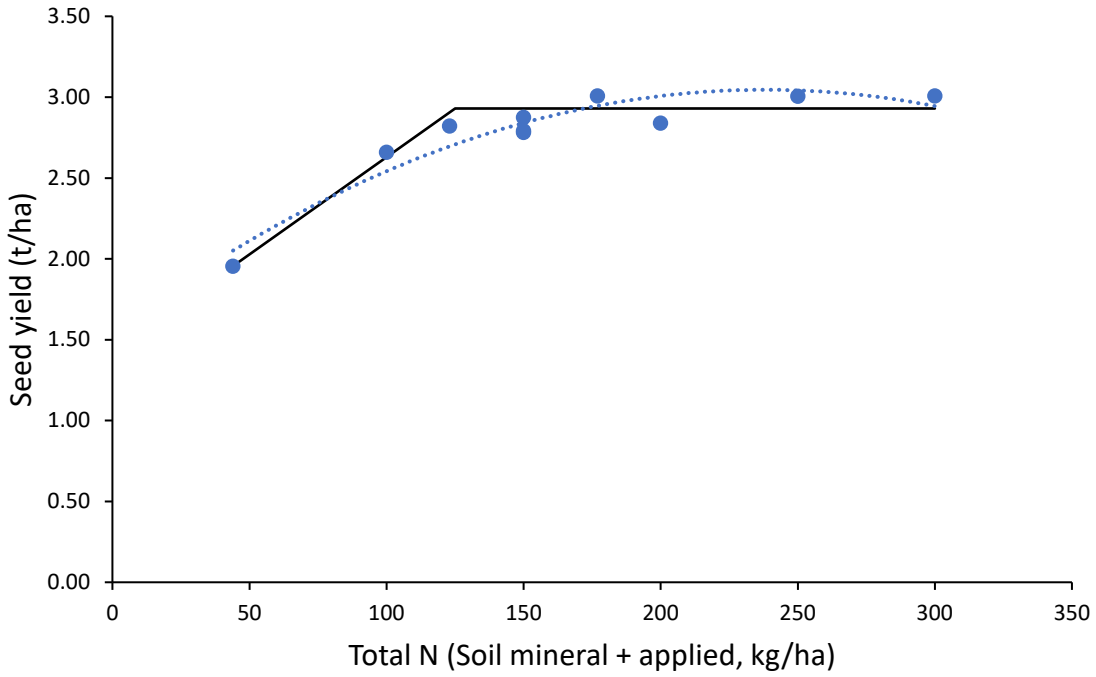
In the meantime, FAR is in the second year of a three-year study on improving seed yield of the so-called "low aftermath heading" varieties, which produce more vegetative tillers, especially after the usual harvest window has concluded.

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. There could be scope for countering this with extra plant growth regulator (PGR, e.g. Moddus®). This is one of the focal points of this year's FAR trial at Chertsey. Watch this space as we continue to investigate the many aspects involved in optimising seed yield in these new cultivars.

Nitrogen on plantain seed crops

In recent years, FAR has been conducting research on the optimal rates and timing of nitrogen fertiliser for plantain seed crops. These studies have shown a "break point" (Figure 1) of around 125 kg N/ha (including soil N), beyond which economic returns on applied N begin to diminish. The first application of N is usually in the next week or so, with another one at closing (around the end of October) and then a further application a month after closing.

Figure 1 (over page): Seed yield response to nitrogen in a plantain seed crop grown near Southbridge in the 2023-2024 season.



Maize

Pre-emergence herbicides in maize

Getting the most out of your pre-emergence herbicides requires an understanding of the factors that can affect how successful they are. The first step is to have an idea of what weeds are likely to come up based on paddock history, and whether there has been any history of herbicide resistance, either in the paddock or in the area. As always, it is important to use a range of herbicide Modes of Action (MoAs – see Table 1) across the whole rotation to lower the chances of herbicide resistant weeds developing.

Some other important considerations include:

- Time of planting: earlier sowing increases the likelihood of needing a follow-up post-emergence spray.
- Weather forecast. Most pre-emergence herbicides need moisture to activate the active ingredient, or else they need to be incorporated into the soil.
- Soil type, crop residue and soil organic matter can influence herbicide effectiveness. Read the label and/or consult with your agronomist.

Further reading:

- Maize Update 90
- FAR Focus 17 – Maize Weed Management

Table 1. Selective pre-emergent herbicides registered for use in both maize silage and grain crops.

Mode of Action Group Number	Active ingredient	Type	Products	Primary weed target
3	pendimethalin	pre- and post-emergence	AGPRO pendimethalin, Stomp® Xtra, Strada®	Broadleaf + grasses
5	terbuthylazine	pre- and post-emergence	Assett™, AGPRO terbuthylazine, Magneto®, Terb 500™, Terbaflo, Timberwolf	Broadleaf
14	saflufenacil	pre-emergence	Sharpen®	Broadleaf.
15	acetochlor	pre-emergence	Ace™, Acetoken, Acierto®, Agcare® acetochlor, AGPRO acetochlor, Donaghys acetochlor, Joker®, Maize Guard®, Roustabout®, Smart acetochlor, Sylon®	Grasses + some broadleafs including: Amaranthus species, black nightshade, chickweed, redroot, Scotch thistle, seedling dock, shepherd's purse, stinking mayweed, rayless mayweed, twin cress
	alachlor	pre-emergence	Alaken, Corral®, Cyclone®, Encaps®, Merit®, Taipan®	Grasses + some broadleaf, including: black nightshade, fathen, redroot.
	dimethenamid	pre-emergence	Frontier®	Grasses + some broadleafs including: apple of Peru, black nightshade, fathen, redroot, seedling dock, spurrey, twin cress, willow weed
	metolachlor	pre-emergence	Guvnor™ Gold, Metoken Gold, Super Maestro	Annual grasses
	propachlor	pre-emergence	Ramrod®	Grasses + some broadleaf, including chickweed and groundsel. Only susceptible at higher rates: fathen and redroot
27	mesotrione	pre- and post-emergence	AGPRO Mesotrione, Dominator®, Donaghys Lektor, Mesoflex®, Primiera®	Broadleaf including: Bathurst bur, black nightshade, chickweed, dandelion, fathen, fennel, fishtail oxalis, Galinsoga, hairy nightshade, hemlock, mallow, redroot, seedling docks, spurrey, stagger weed, twin cress, willow weed and wire weed

Soil temperature monitoring

Maize germination and emergence are dependent on temperature, especially soil temperature. Soil temperatures need to be at or above 10°C and rising (at 9:00am at planting depth) for successful germination. In combination with soil temperature, germination is triggered by absorption of water through the seed coat. Maize kernels must absorb (imbibe) about 30 % of their weight in water before germination begins. Less than optimum absorption of water combined with cold soil temperature may slow or halt germination. Maize typically requires from 55 to 85 Growing Degree Units to emerge (using a 10°C base for GDU calculation).

Planting early in the season does have advantages; these include early flowering, which is particularly advantageous in years where the risk of drought stress is high. However, it should be noted that when planting early in the season, getting seed in the ground one day earlier does not mean one day earlier to flowering. Also, because of the slower earlier growth, planting early can result in the need for greater weed control because row closure is slower.

Tillage can also have an effect on soil temperature. Cultivation tends to increase soil temperatures compared to no-till, and seedlings tend to emerge faster following cultivation. Slower emergence and higher slug numbers need to be considered in no-till crops.

Table 1: Soil temperatures at 10 cm (as at 9:00 am, 22/9/2025) for some key maize-growing regions in New Zealand. Also shown are the temperatures for the same time period last year.

Region	Station	Soil Temp (°C)	2024 Temp (°C)
Northland	Kaikohe	14.2	13.6
Waikato	Rukuhia	14.3	13.0
Bay of Plenty	Te Puke	13.3	12.1
East Coast	Gisborne	12.1	12.3
Hawke's Bay	Havelock North	16.4	13.5
Manawatu	Levin	12.5	11.5
Canterbury	Lincoln	9.9	9.2
	St Andrews	8.4	8.2

Oilseed Rape

Plant growth regulators (PGRs) in oilseed rape

PGRs should be applied to oilseed rape crops to prevent excessive growth in the period before flowering. This reduces lodging and improves light interception by the plant, leading to higher yields. It can also help even up seed ripening.

The PGR of choice for oilseed rape is tebuconazole, which is most commonly sold as 430 g/L formulations (check your pack before applying at the rates described in this article). As long as the crop is healthy and not stressed, PGR is applied at the green bud stage at 600 mL/ha. Alternatively, for enhanced lodging control (for instance if the crop is very lush), a split application (both of 500 mL/ha) can be applied at early stem extension and at green bud.

Vegetable seeds

Consider alternative pollinators

While we are still some way off from the start of flowering, it might be a good time now to think about setting up for alternative pollinators. Drone flies (*Eristalis tenax*) can be more efficient than honeybees in some situations, and setting up environments where they can thrive within the crop is easy and relatively inexpensive. Check out the link above and see if this could work for you. There is also a podcast available on this topic here.

Weather Updates

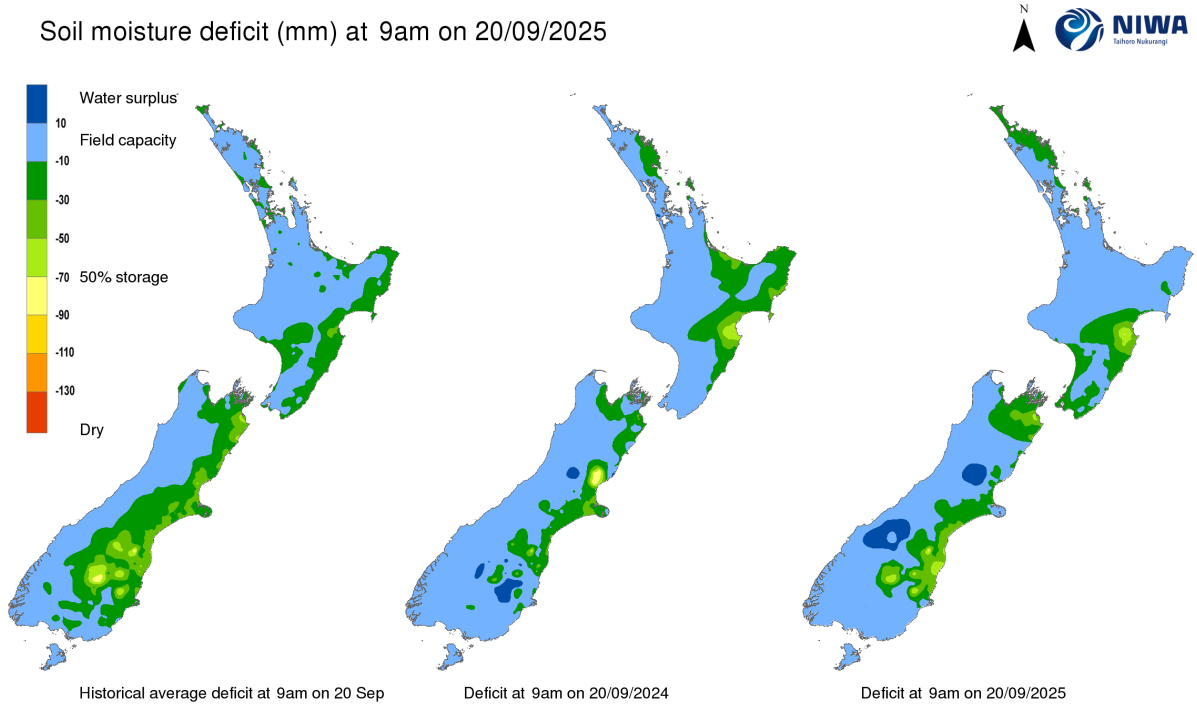
Long-term weather outlook

The long-term climate forecast from ESNZ (Earth Sciences New Zealand, formerly NIWA) has been released for the September to November period. They are predicting that New Zealand as a whole will experience weather conditions coming out of the west more than usual, while transitioning into an October and November with higher-than-usual air pressure. There are expected to be alternating periods of settled weather and northeasterly flow anomalies during this time. Temperatures are equally likely to be either warmer than average or average. Rainfalls are predicted to vary across the country. The east of the South Island should prepare for lower-than-average rainfall levels, while the north and east of the North Island can expect average or above average rainfall. Other areas are expected to be about normal.

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. 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 NIWA here.



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