FOUNDATION FOR ARABLE RESEARCH

FAR®

Growing Maize on Peat Soil

Wednesday 4 February, Hamilton

ADDING VALUE TO THE BUSINESS OF CROPPING

Health & Safety

Please take appropriate care and be aware of potential hazards. For your safety, please:

- Follow instructions from FAR staff, or farmer hosts, at all times.
- Stay within the areas specified by FAR/farmer hosts.
- Report any hazards noted directly to a member of FAR/event staff.

First aid and emergencies

FAR staff are qualified First Aiders and there are First Aid kits on site. Should you require any assistance, please ask a FAR staff member.

In case of emergency notify a FAR staff member or call 111 and provide the address of the event:

- **Courtesy of Stobie family: 1009 Woodlands Road, Hamilton, 3281**

FAR Contact on site:

Rachel Mudge

Mob: 022 699 1094

Dirk Wallace

Mob: 020 4039 2522

Stobie Farm Information

Land Use	Area (ha)
Pasture	200
Maize Silage	120
Maize Grain	80
Total Area	**400**

Rotation: 1 year maize then 1 year grass. This block is in silage.

Rough timeline:

- Spray out about 20th to 30th September.
- Plant about 15th to 25th October.
- Harvest 15th to 30th March. Plant permanent grass ASAP.
- Fatten winter trade lambs. Last ones gone by 30th September.
- Fatten Steers from 1st October to 30th September the following year

Planting Process - Yield, 27.5 ton per hectare.

- Spray out, with about 2 weeks fallow
- Chip Hoe
- Single pass chisel plough
- Base Fert
- Pre plant power harrow
- Plant

Nutrient Input: Bob from Agknowledge will give us this information.

The Details to Manage

Drainage - Manage the water table

Contour. E.g. Cut and fill high spots and hollows. Very important to not pond water.

Fertility - Must have good nutrient levels, and or be raising them if needed.

Must spread nutrients evenly across paddocks.

The outside round is normally your largest area of the paddock. So, it must be performing.

Planting - Try to only plant into good soil conditions - not too wet and not muddy.

Farmer view - Regulations and or compliance; these must be fit for purpose/practical.

Maize grower/trader view - Having consistent demand/sale price that reflects the risk.

- Cheap imported feeds. E.g. Palm kernel.

NUE Indicator Demonstration (2025-26)

Project Leader: Emmanuel Chakwizira

Region/ Farmer: Waikato region – Donald Stobie

The aim of this project is to enhance on-farm nitrogen (N) management in the arable sector, leading to improved economic outcomes and fresh water quality.

Specific Trial Objectives on This Farm:

- Understand if an NUE indicator works on a peat soil
- Determine how well the potentially mineralisable soil N test (PMN test) performs on a peat soil

Cultivar Sown & Establishment

- Establishment: See farm notes
- Hybrid: P01636
- Target population: 105,000.
- Sowing date: 20 October 2025
- Planting: Gavins Ltd
- Each plot is 5 rows (2.5 m) wide by 12 m long, with 1 row between the Reps.

Crop yield estimate = 28 t DM/ha
Estimated amount of N the maize crop requires = 350 kg N/ha

Soil N Test Results

- Soil mineral N to 30 cm depth = 52 kg N/ha
- Soil mineral N to 60 cm depth = **142** kg N/ha
- PMN to 30 cm (November – February) = 262 kg N/ha

NOTE: PMN test is not validated for peat.

Nitrogen Management Decisions

The crop needs 350 kg N/ha to achieve the yield estimate. This was calculated using of the N rate of 12 kg N per tonne of maize silage produced. Optimum nitrogen fertiliser rates should account for the nitrogen in the soil.

Optimum rates for other sites are calculated using the amount of soil mineral N in the soil to 60 cm at planting. Plus, an estimate of nitrogen mineralisation through the growing season in the top 30 cm soil depth, using the PMN test. For this site we have had to drop the use of the PMN test when calculating the optimum N rate (N4, Table 1), as it has not been validated on peat soils. However, we **have** included a treatment that includes PMN tests (N5, Table 1), based on an adjusted 'Confidence Factor' of 50%.

The optimum rate for this site (N4) was calculated as:

- Difference between crop needs and estimated soil N supply = **208** kg N/ha.

- Revised fertiliser N requirement, excluding PMN = **236** kg N/ha (N4, Table 1).

The optimum rate for this site (N5) was calculated as:

- Revised fertiliser N requirement, including PMN = **125 kg N/ha** (@50% Confidence factor), this becomes Treatment N5.

Table 1: Trial Fertiliser Splits [Side-dressing figures, adjusted for soil minN &/or PMN]

Trmt	Trmt description	N rate (kg N/ha) at different growth stages		Total N fertiliser applied (kg N/ha)	Sustain N at V6 (kg/plot)
		V3	Side-dressing (V6)		
1	N1 (0)	0	0	0	0
2	N2 (50% of N4)	30	88	118	0.58
3	**N3 (Farmer rate)**	**30**	**250**	**280**	**1.63**
4	N4 (Opt, soil minN only)	30	206	236	1.35
5	N5 (minN + PMN)	30	95	125	0.62

Nitrogen Treatment Rates Explaining Table 1

Treatment	Description	Rate
N1	Control (No Nitrogen)	0 kg N/ha
N2	50% of N4	118 kg N/ha
N3	Farmer Rate	280 kg N/ha
N4	Optimum N Rate	236 kg N/ha
N5	Crop N requirement: (soil minN + PMN)	125 kg N/ha

Notes:

- ***N4*** *is calculated as: N requirement for 28 t DM/ha (350 kg/ha) minus mineral N to 60 cm depth. The 236 kg N/ha figure is based on a confidence factor of 80%.*
- ***N5*** *uses a confidence factor of 50%, which accounts for peat soils having high soil N immobilisation.*
- *N requirement for 28 t DM/ha (mean yield at site) is based on 12.5 kg N/ ton of silage produced*

Trial Design

Table 2: Trial Plan - Maize NUE Indicator Trial

Rest of Paddock side				
280 kg N/ha	125 kg N/ha	0 kg N/ha	118 kg N/ha	236 kg N/ha
118 kg N/ha	236 kg N /ha	280 kg N/ha	0 kg N/ha	125 kg N/ha
Fence side				

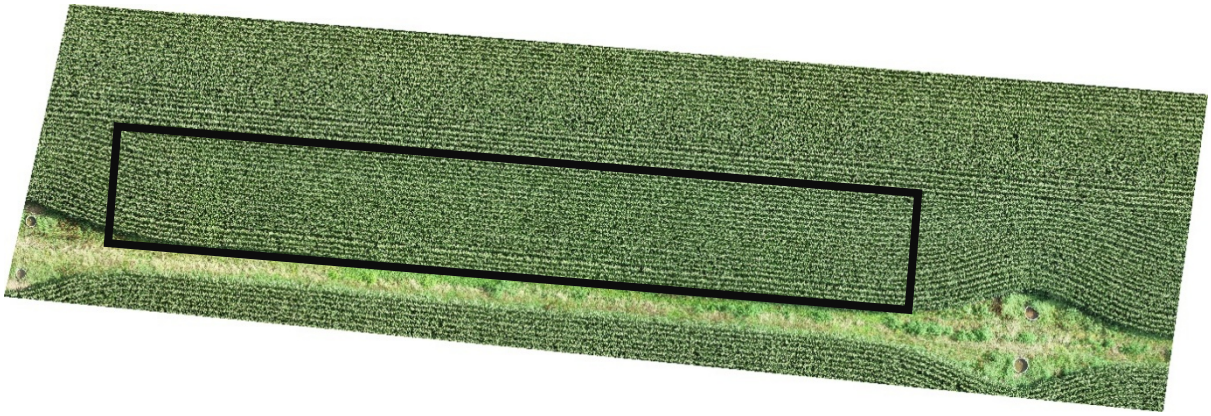

Figure 1: *Drone image taken on 29/01/2026 trial area in the black box*

What's Happening Next?

Hand harvest for yield and submit samples for feed quality to understand what effect N decisions had on dry matter and feed quality.

Notes:

Foundation for Arable Research
PO Box 23133, Hornby
Christchurch 8441

Phone: 03 345 5783
Email: far@far.org.nz

Follow us

@FARarable

www.far.org.nz