Irrigated Cropping Council

Summer Cropping Field Day

Wandella
10th March 2022

Note from the EO

Charlie Aves, Irrigated Cropping Council

Welcome to our first field day for what feels like a long time. We're super excited to be back out in the paddock showcasing the field trials being conducted by our research team Damian Jones and Rohan Pay. These notes focus on the lessons being learnt on our summer research site, below are just a few notes some of the extension projects that ICC that are being delivered by our communications and extension team Melinda Mann and Belinda Lambert.

Southern NSW Drought and Innovation Hub

Belinda Lambert is your conduit into the newly created SNSW Drought and Innovation Hub. The aim of the hub is to increase the drought resilience capacity of the agricultural industry and the rural, regional and remote communities living with the issue and consequences of drought. There are 8 hubs across Australia and they make up a key component of the Future Drought Fund.

The hub will enable regional stakeholders to have a voice in drought resilience activities, create opportunities to you to collaborate with experts, gain access to resources, as well as to participate in extension and adoption programs such as workshops, seminars and field days.

The Southern NSW Drought Resilience Hub is a consortium of nine regional partners including primary producers, Indigenous, industry and community groups, researchers, entrepreneurs, education institutions, resource management practitioners and government agencies and is led by Charles Sturt University.

Belinda is currently talking with members and the broader farming community on both side of the river to learn about what drought means, what has worked or failed in the past and what the knowledge gaps or opportunities are. For any hub related inquires or to add your thoughts on what would be of value from the hub contact belinda.lambert@irrigatedcroppingcouncil.com.au 0412 400 484

Membership

We continue to strive to deliver value to members. As ICC members you receive exclusive access to our long-running variety results, some of the only fully irrigated variety trials in the region, in a timely manner with yield results available at harvest.

Discounted or free access to ICC events such as our winter crop field day and annual conference when we're allowed to run them! Access to the members area of the website which includes exclusive results from ICC run research. Regular updates of research, programs and events of relevance to irrigators.

Value

We are grateful that our sponsors Graingrowers, Pioneer, AGT, Pacific Seeds, Adama, Hybrid Ag, Rubicon and Water Partners subsidise ICC membership so that it remains the price of a slab of beer - $50.

Irrigation Discussion Groups and Optimising Irrigated Grains

A key component of the GRDC Optimising Irrigated Grains project is the Irrigation Discussion Groups of which the ICC host one. At the start of this project, we consulted with farmers about what they wanted to do and the response was "there is so much knowledge in this room, we want to learn from the others how they are building flexibility into their farming systems and responding to the high opportunity cost of water". As a result, we have been visiting farms across the region to get a sense of what changes they have been making over time, why and what lessons have been learnt along the way. Watch our socials and website to see upcoming Discussion Group activities.

To compliment the visits already conducted there is a series of case studies available on our website and we have also conducted a couple of focus paddock experiments. The first with Michael Hughes at Pretty Pine was a look at trying to ameliorate soils by incorporate manures produced on farm at depth using the commercially available Raptor Deep Ripper from TTQ Agriculture and speed tiller. The other at the trial block looked at grain and graze of new varieties of winter canola.

These discussion groups are run alongside 2 linked projects, one running 66 field trials a year to determine the agronomic levers to pull to increase productivity of irrigated canola, barley, durum, faba beans, chickpeas and maize. The other to develop a tool to help maximise profitability of irrigation water.

Plan2Farm -Irrigation Business Planning

Plan2Farm is being delivered in partnership with North Central CMA. This project is supporting 20 farmers in the region to develop a business plan on-farm with a consultant. Participants also get to attend invite only small group activities addressing the focus of building resilient irrigation businesses. This project is funded by the Future Drought Fund and is now fully subscribed.

Thank you

Thank you to our collaborator and host Colin Gitsham and family. Their support of the summer site, patience, help and generosity is thoroughly appreciated.

The Irrigated Cropping Council is a small organization so everything we deliver is a product of collaboration. We would like to acknowledge the partners and funders for trials at the site and thank them for their continued support of irrigated research in this region.

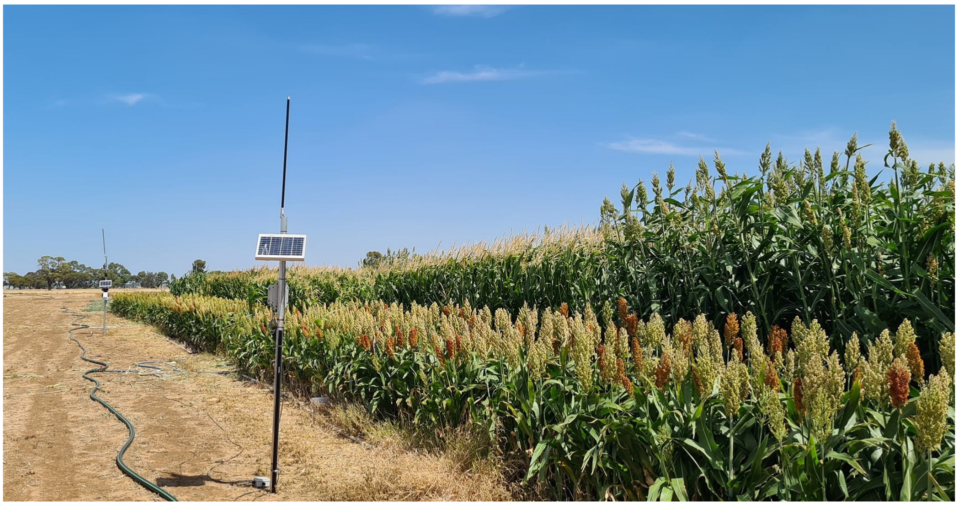
-Optimising Irrigated Grains, funded by the GRDC and lead by FAR Australia

-Summer Pulse Demonstration, lead by Agriculture Victoria, funded by the GRDC

-Fodder for the Future, lead by Murray Dairy and delivered in partnership with Agriculture Victoria, Birchip Cropping Group, Melbourne University at Dookie, Southern Growers and Riverine Plains. This project is funded by the Federal Government under the Murray–Darling Basin Economic Development Program.

-Pioneer Seeds

-Pacific Seeds



About the Research Site

Location:	Kerang, Victoria
Sown:	2nd November 2021
Cultivar:	P1756 88,000 pl/ha
Rotation position:	Maize (2020/21), winter pasture 2020 - 2017
Soil Type:	Neutral medium grey clay
Irrigation:	Surface irrigation. Watered up 5 November (1.1 Ml/ha)
In-crop irrigation:	8.5 Ml/ha
GSR:	November to March 2 101 mm

Timelines

October:	Superfect (60 kg P/ha) broadcast and disced in.
	Regraded. Gypsum broadcast (2.0 t/ha).
November:	N pre-drilled as required.
	Sown 2 November and watered up 5 November.
	Atrazine 1.1 kg/ha 24 November.

Soil test (0-10cm) 17/12/2021

Phosphorus (colwell)	156 mg/kg
Potassium	760 mg/kg
Sulphur	169.3 mg/kg
Organic Carbon	1.22%
pH (water)	7.8

Nitrogen (NO3)	(0-10cm)	56 kg N/ha
	(0-30cm)	168 kg N/ha
	(30-60cm	126 kg N/ha

Treatment Summaries

Nitrogen Use Efficiency Trial - Rates
N application Treatments (kg N/ha)

Treatment	**Total kg N/ha**	At sowing	4-6 leaf
1	**0**	0	0
2	**80**	40	40
3	**160**	80	80
4	**240**	120	120
5	**320**	160	160
6	**400**	200	200
7	**480**	240	240
8	**560**	280	280

Row Spacing and Plant Population Trial
Treatments: Row Spacing (inches) and Plant Population (plants/ha)

Treatment	Row Spacing	Population,
1	20	84,000
2	20	100,000
3	20	123,000
4	30	84,000
5	30	100,000
6	30	123,000

Nitrogen Use Efficiency Trial – Timing
N application Treatments (kg N/ha)

Treatment	Timing	Sowing	3-4 leaf	6-8 leaf	8 leaf	Tasseling	Total
1		0					**0**
2	Urea	300					**300**
3	Npower	300					**300**
4	Urea	100	66	66		66	**298**
5	Urea	100	100		100		**300**
6	Urea	100	66	66	66		**298**
7	Urea	100		100			**200**
8	Npower + Urea	200		100			**300**
		2 Nov	10 Dec	20 Dec	29 Dec	20 Jan	

Micronutrients Trial
Treatment N summary (kg N/ha) and timing of application

Treatment		N Sow	4 Leaf	6 Leaf	8 leaf	Total
1	Control	0	125		125	**250**
2	Micro @ silk	0	125		125	**250**
3	Micro +14	0	125		125	**250**
4	Micro Early	0	125		125	**250**
5	Control	125		125		**250**
6	Micro @ silk	125		125		**250**
7	Micro +14	125		125		**250**
8	Micro Early	125		125		**250**
		2-Nov	4-Dec	20-Dec	29-Dec	

Micronutrient application (Complete K) timing and rate (l/ha)

Treatments	l/ha	Application	Timing	Date
1 & 5	0	-	-	-
2 & 6	5	Foliar	Silking	20-Jan
3 & 7	5	Foliar	Silking + 14 days	3-Feb
4 & 8	10	Soil	2 Leaf	28-Nov

Average Populations:

Target	Actual
84,000	82,000 pl/ha
100,000	104,000 pl/ha
123,000	120,000 pl/ha

Dry matter cuts at 6 leaf saw no significant differences between treatments, with an average of 2.57 t/ha.
All plots have received 300 kg N/ha, split between sowing and 8 leaf.

Optimising Irrigted Grains

GRAIN MAIZE RESULTS SUMMARY – YEAR 2 (2020 – 2021)

Nick Poole, FAR Australia and Damian Jones Irrigated Cropping Council

10 irrigated grain maize trials were established at two locations in northern Victoria. The primary focus of this second year of field research was to look at the influence of higher levels of nitrogen (N) input on harvest dry matter, grain yield, harvest index, nitrogen offtake and profitability.

In addition, the research programme also examined the influence of plant population, row spacing and disease management. At the main research sites in Peechelba East and Kerang, irrigation was provided by overhead pivot and surface irrigation (Flood - border check) respectively. Total irrigation quantities applied were as follows, Peechelba East (Pivot 5.1 Mega L/ha applied) and Kerang (Surface irrigation border check 11.6 ML/ha). All research was conducted using the Pioneer Hybrid P1756, the same hybrid used in year one of the programme. To ensure soil type consistency between seasons the principal trials were conducted at the same field research sites (different parts of the paddock) as 2019/20. At Peechelba East on a commercial farm (red loam over clay) the research was conducted under the same pivot as 2019/20(not on the same area under the pivot) with all trials established into grain maize residues from the previous season, compared to grain maize following oaten hay stubble in the first year of research. At Kerang (self-mulching grey clay) in both years maize research has been conducted following grass dominant pasture.

Grain yields and nutrition

Grain maize crops yielding16 -19t/ha with dry matters of 33 - 35t/ha commonly remove 400kg N/ha from the soil, but in results generated over the last two years these crops do not respond significantly to N fertiliser inputs greater than approximately 250kg N/ha. Of the nitrogen removed by the crop canopy at harvest approximately 30 – 35% of the N is returned to the soil as stover residues, so based on a 400kg N offtake approximately 120 - 140kg N/ha is returned to the soil as harvest residues. Applications of nitrogen in excess of 250kg N/ha with up to 550kg N/ha experimented upon in the project have been largely uneconomic in the season; these applications lost up to $400/ha depending on the price of N fertiliser and the exact rates of N applied. With applications of N fertiliser commonly applied at levels of 300 – 450kg N/ha on farm for irrigated grain maize it has not been possible to illustrate that such high levels of N input are the route to higher grain yields in this crop.

Whilst in an irrigated system it is unclear how much of the excess N is available the following season, research conducted indicates that we need to rethink the profitability of such large doses or at a minimum take account of soil mineralisation for nitrogen applications in irrigated summer crops. At both research sites supply of nitrogen from the soil has been responsible for supplementing fertiliser N in the production of large crop canopies and grain yields in excess of 16t/ha.

Whilst we cannot mine our soils without regard to this contribution, the research has illustrated that in-crop mineralisation in the summer months is an extremely significant contributor to the N budget calculations under irrigation. Whilst over fertilising can be claimed to be beneficial for following crops it is important to recognise that this research has failed to generate any evidence to suggest that grain maize crops can respond (with statistical significance) to more than 250kg N/ha. Clearly, the level of organic carbon in the soil will vary and contribute different amounts of soil N supply through the course of a season, however the key finding has been our inability to generate significant yield responses up to the levels of fertiliser being applied on farm. At Peechelba East in 2021 the research was conducted in a maize-on-maize scenario in order to test whether economic responses could be secured from higher amounts of N compared to 2020 when maize was grown following oaten hay.

Overall grain yields were lower yielding at 16 - 17.5t/ha in 2021 and although 17t/ha crops were achieved with N rates above 250kg N/ha, the economics were marginal - in some cases slightly positive (Trial 1) and in other cases negative (Trial 3). In no cases at this site over the last two years were statistically significant yield increases achieved with N rates above 250kg. These results have been generated in commercial situation where 200 – 230kg N/ha has been applied as fertigation with applications from V4, V8 and pre VT (tasselling). In 2020 at this site the highest grain yields recorded (machine harvested plots) were 18 - 19t/ha; these were produced on crop canopies fertilised with approximately 250kg N/ha (50N as pre drill urea and the remaining 200N as fertigation).

N timing has failed to generate significant yield effects but for the second year there has been some evidence to suggest split applications, with an emphasis on later applications (up to tasselling), has been associated with higher grain protein. In addition, if large applications were made at sowing as single doses there was evidence to suggest nitrification inhibitors (eNpower) have a role, but yield increases were not statistically significant.

Plant population and row spacing.

Over two years plant population and row spacing have been noted to have significant effects on dry matter production and grain yields. Optimum plant populations at Peechelba East maize on maize were lower than those observed following oaten hay in 2020 when yields were higher (18 - 19t/ha). At yields of 16 - 17t/ha when maize followed maize, an economic optimum of 80,000 plants/ha was established compared to 92,000 plants/ha with the same hybrid P1756. Although there was evidence that higher plant populations respond to higher N input, the best margins ($/ha)from the Peechelba East site in 2021 were generated with 230kg N/ha (applied as fertigation) applied to 80,000 plants/ha.

At Kerang there was no yield advantage associated with higher plant populations (105 - 107,000 plants/m2) of hybrid P1756 compared to 83 - 84,000 plants/m2. Spatial configuration of the low plant populations is an important consideration from results generated so far, with data suggesting that narrower row spacing combined with lower plant populations may offer higher productivity than the traditional 750mm row spacing. In 2021 at Kerang the combination of 500mm row spacing and lower plant population generated the highest grain yields on the research site. At Boort in 2020 decreasing row spacing from 750mm (approx. 30 inch) to 500mm (approx. 20inch) significantly increased grain yield with a 3.46 t/ha yield increase (trials hand harvested).

This will be a major emphasis of the final year of research in 2021/22 as it has been one of the few factors, other than overall N input, to significantly influence maize grain yield. Poorer establishment in that trial resulted in no significant differences due to plant population. Foliar nutrition

The project with the assistance and support of industry evaluated a number of different foliar applications of both macro and micronutrients in 2021. At Peechelba East these liquid fertilisers (based on calcium nitrate and Natures K) were applied as supplement applications on top of a standard N fertigation strategy (based on 230N) and a higher N input of 420kg N/ha at V5, V7 and up to V9.

There were some interesting interactions and significant effects on total dry matter produced but no statistically significant yield responses over the standard N controls. Potassium levels in the newest tissue were shown to be low at this site when assessed at tasselling, but none of the treatments were seen to significantly increase K concentration in the upper leaves relative to the untreated crops.

At Kerang an application of Spraygro Complete K (an NPK trace element liquid) applied at silking and 14 days after silking had no impact on yield. Monitoring of tissues at Kerang revealed tissue levels of key elements to be sufficient when assessed at silking, apart from N concentration. In this first year of evaluation the significance of the results generated did not live up to the level of discussion that generated the research programme. Work in this area will continue in 2022.

Rotation Position

To better understand the effect of previous crop the research at Peechelba East took quadrat cuts out of an adjacent crop of P1756 that was grown following a crop of faba beans that was terminated in October.

Although results are not statistically comparable using equivalent N input from research conducted with maize on maize, the comparison revealed greater overall DM production and grain yield (18.17t/ha) where maize followed a terminated faba bean crop compared to 16.59t/ha following maize (note yields are expressed at 0% moisture in this case).

Disease Management

Two trials looking at experimental treatments based on triazole(Group 3 DMIs)and strobilurin (Group11 QoI) fungicides produced no economic response to application and no evidence of increased green leaf retention in the maize canopy. Other than low levels of common rust (Pucciniasorghi) little foliar disease was observed in these trials.

This two years of research work examining this aspect of agronomy research will now be discontinued and greater emphasis placed on row spacing, population and nutrition for 2022. In the maize-on-maize scenario at Peechelba East a low frequency of blackened plants was identified in the trials, but the foliar fungicides had no impact on the level of these blackened plants.

GRDC GRAINS RESEARCH & DEVELOPMENT CORPORATION

The optimising irrigated grains projects are part of the GRDC investment in ICF1906-002RTX: Facilitated action learning groups to support profitable irrigated farming systems in the northern and southern regions, FAR1906-003RTX: Development and validation of soil amelioration and agronomic practices to realise the genetic potential of grain crops grown under a high yield potential, irrigated environment in the northern and southern regions and UOT1906-002RTX: Optimising farm scale returns from irrigated grains: maximising dollar return per megalitre of water.

FAR AUSTRALIA

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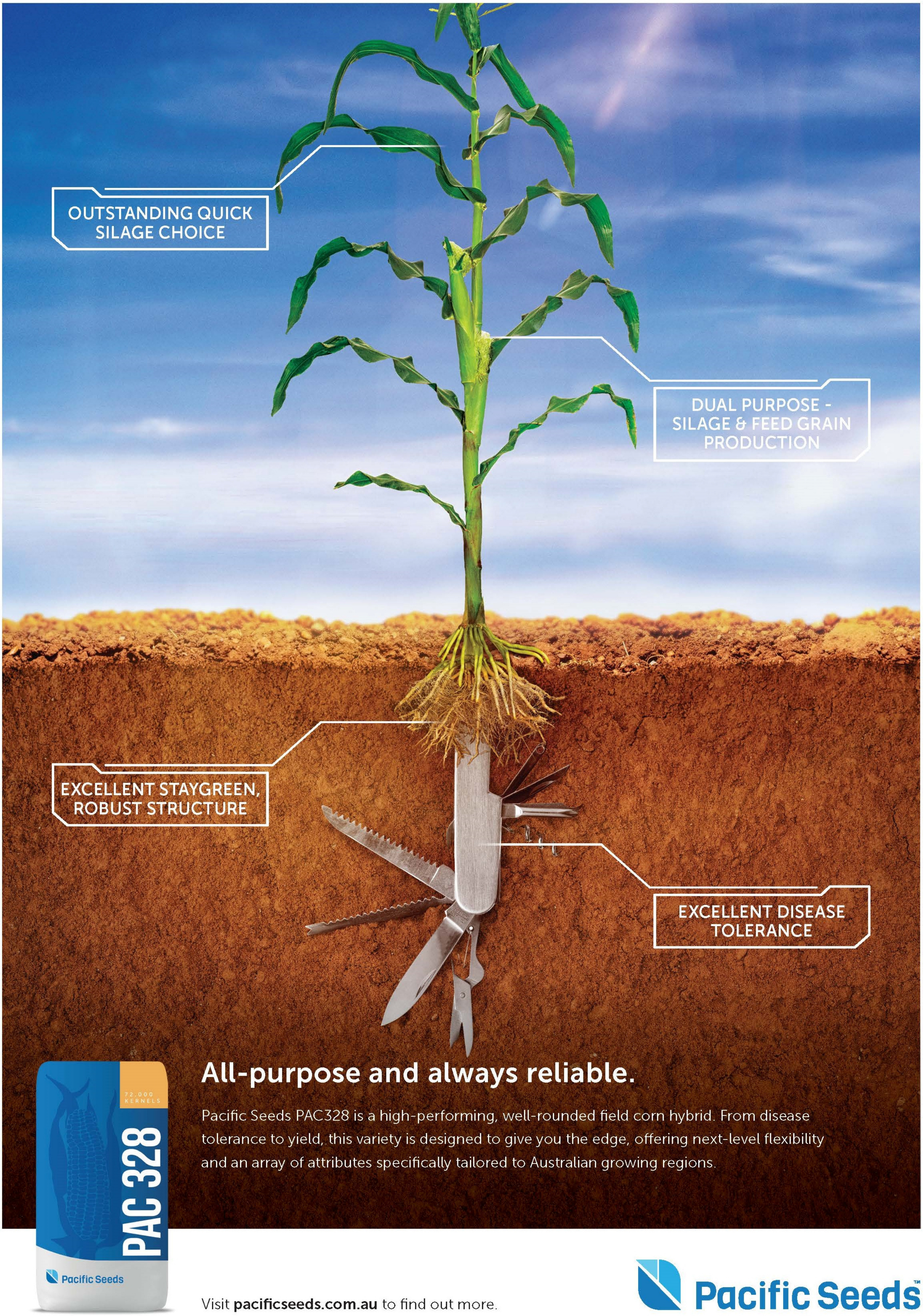
Promoting irrigated agriculture



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Fodder for the Future

Over the 2020/21 summer the Irrigated Cropping Council grew our first forage trials for Murray Dairy. The aim of the trial was to assess a range of grain, sweet sorghums and maize species to see which are the most water efficient forage (silage) producers.

We compared three different irrigation strategies, the first "high" treatment was targeting best practice scheduling for maize, the "mid" treatment had a longer irrigation interval targeting the assumed best practice for sorghum and the "dry" treatment was designed to stress plants by stretching the irrigation interval to save water. The irrigations in each treatment were triggered by soil moisture sensors and over the season 11.25ML was applied to the high on an average interval of 9 days, the mid received 7.7ML on an average interval of 14 days and the dry received 6.05ML on an interval of 20 days. These irrigation totals include a pre-irrigation of 1.1 ML/ha across the entire block. We received 116mm of rainfall between December and March.

We planted Megasweet forage sorghum, Sentinel red grain sorghum, Liberty white grain sorghum, PAC606IT which is a mid-season corn, and PAC440 a short season corn in the first week of December following the pre-irrigation.

Our target plant populations where 200,000 plants/ha on 35cm row spacing for the sorghums in the mid and high irrigation strategies and 100,000 plants/ha on 70cm row spacings on the dry. For the maize we targeted 90,000 plants/ha on 70cm row spacing for the mid and high treatments and 47,500 plants/ha in the low treatment.

During the season the white sorghum had reduced water use compared with PAC440, however PAC440 was the highest yielding across all irrigation strategies, producing over 22t DM/ha in the mid and high strategies. Maize did give the best dry matter/Ml when compared to the sorghums across all irrigation treatments.

Megasweet also produced dry matter over 21t DM/ha in the mid and high strategies. We did not see the significant drop off in yield by moisture stressing corn that we expected, we believe that this is due largely to the cold summer. In an average or hot season, we might have seen a greater response to moisture stress.

A more detailed look at water for the 2021/22 season

Our aim remains the same as for the 2021/22 season, however this year we are striving to gain a better understanding of water movement and uptake under the different irrigation strategies. We have planted the same crops, varieties and targeted the same plant populations as in 2021. This year we have added a fourth irrigation strategy (details in table 1 below) and have increased the number of soil moisture sensors within the block.

Table 1: Irrigation treatments with target total water application amount.

Irrigation Treatment Level	Managed to crop requirements	Target Water Applied (ML/ha)
High	Corn	9.0 ML
Medium 1	75% of Corn – applied based on SMM	6.0 ML
Medium 2	75% of Corn – applied at critical growth stages	6.0 ML
Low	50% of Corn	4.5 ML

Murray DAIRY Dairy Australia Irrigated Cropping Council *Promoting irrigated agriculture*


STATE OF THE GRAINS INDUSTRY
From record production in 2016, to severe droughts and trade disruptions in 2020, the grains industry has seen ups and downs over the past 5 years. The State of the Industry report examines key data that underpins the sector's performance.
To accompany the report, join GrainGrowers' Zach Whale as he talks with growers and key industry players around Australia about the challenges and opportunities facing our grains industry in the State of the Grains Industry Podcast.
Scan the code to download the report & listen today!
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Summer Legumes for Southern Australia

Audrey Delahunty, Ash Wallace & James Nuttall (Agriculture Victoria)

The viability of opportunistic summer cropping within Victoria is being explored, with the aim of offering grain growers knowledge on the agronomic suitability of summer legume species.

This includes best species options for different growing regions, probabilities of spring break opportunities within dryland and irrigated cropping systems. Summer legume crops have the potential to benefit existing production systems by providing:

•Enterprise profitability through high protein grain/ fodder,

•Soil benefits including increased soil nitrogen through fixation,

•Crop diversification options,

•An opportunity to utilise summer rainfall,

•Dewatering of soil profiles prone to waterlogging.

Crops being tested included mungbean, cowpea, dry bean (navy and pinto bean), pigeon pea, soybean, lab lab and adzuki bean.

For the species tested at both Kyabram and Wandella, biomass tended to be higher at Kyabram (Table 1).This is potentially due to the sub-surface irrigation system and the lower weed pressure at Kyabram. At Wandella the biomass ranged between 1.1 and 8.9 t/ha for adzuki bean (M4255) and lab lab (Highworth). The high biomass of lab lab indicates this crop has high suitability as a fodder option with the potential to exceed 9 t/ha of biomass.

Further analysis of the feed quality is required, where within northern Australia lab lab is used as a high protein fodder option. A preliminary assessment of plant nodulation indicates that soybean, pigeon pea, lab lab and cowpea nodulated well at Wandella, and at Kyabram dry bean, pigeon pea and soybean had sufficient nodules (between 5 and 50 nodules) to support effective nitrogen fixation. The next steps will be to harvest plots and determine grain yield and grain quality.

Figure 1.Soybean crop at Kyabram, Victoria (2021/22).

To evaluate the viability of summer cropping under irrigation, trial sites were established (November 2021) at Kyabram (Fig 1) where irrigation was through subsurface drip tape and at Wandella (Fig 2) where flood irrigation was applied. Both trial locations were located within the Goulburn-Murray Irrigation district, the largest irrigation system within Victoria.

Across the species tested at Wandella, the dry matter production (biomass) ranged from 2.1 and 10.0 t/ha and 10.0 t/ha for navy bean (Spearfelt) and soybean (Bidgee) respectively (Table 1). Overall, the biomass for mungbean was high across the four varieties tested ranging from 6.1 to 7.4 t/ha for Putland and Crystal, respectively. Higher biomass corresponded with good establishment and early growth, where crops which had lower establishment and biomass, such as dry bean tended to have a high weed burden due to poor competitiveness against summer weeds.

Figure 2. Lab lab at Wandella, Victoria (2021/22).

Table 1. Plant biomass (t/ha) for species at Wandella and Kyabram, Victoria. Biomass cuts were taken during the reproductive stage for all species.
Asterisk is where crops is not tested.

Species - Variety	Biomass 18-Feb 22 (t/ha)	
	Wandella	Kyabram
Adzuki bean - Erimo	2.3	3.8
Adzuki bean - M4255	1.1	3.4
Cowpea - Ebony	2.9	*
Cowpea - Red caloona	3.8	6.0
Dry bean - Black turtle bean (Nut Co.)	*	2.6
Dry bean - Navy bean (Arwon)	*	4.3
Dry bean - Navy bean (Spearfelt)	1.2	2.1
Dry bean - Pinto bean (Bean Growers)	*	2.5
Dry bean - Pinto bean (Kyabram)	0.8	*
Lab lab - Highworth	8.9	*
Mungbean - Cellera II-AU	2.0	6.0
Mungbean - Crystal	*	7.4
Mungbean - Jade-AU	3.7	6.3
Mungbean - Putland	*	6.1
Pigeon pea - ICPL87095	*	4.0
Pigeon Pea - QPL 97	1.6	*
Soybean - Bidgee	*	10.0
Soybean - Burrinjuck	6.1	5.0
Soybean - Djakal	*	4.5
Soybean - Hayman	5.7	*

Within irrigation districts in Victoria, summer legumes provide an option to diversify the cropping system. Summer legumes are likely to provide an additional source of high protein fodder or grain and a means to increase soil nitrogen within existing systems. Low summer weed pressure will be an important consideration to optimise biomass and yield. Next steps include research to optimise agronomic management within irrigation regions, including assessing herbicide options and establishment of larger paddock scale trials through engaging with growers. Importantly, the viability of summer legume crops within irrigated cropping may fluctuate given seasonal water access/ price and grain markets which ultimately underpin the economic benefits.

Acknowledgments
The 'Alternative legume crops for the southern region' project is supported by Agriculture Victoria and the GRDC through the Victorian Grains Innovation Partnership. The Wandella trial was established in partnership with the Irrigated Cropping Council. We also acknowledge the broader research team at Agriculture Victoria and Kilter Rural for their support in conducting this research.

Getting Harvest Right to Maximise Fodder Returns

David Lewis, Technical Services Manager, Lallemand Animal Nutrition

When growing crops for silage consider animal and feed requirements and how the silage will be stored and fed for beef, dairy, sheep, other.

- Feeding system
- Storage system
- Harvesting method

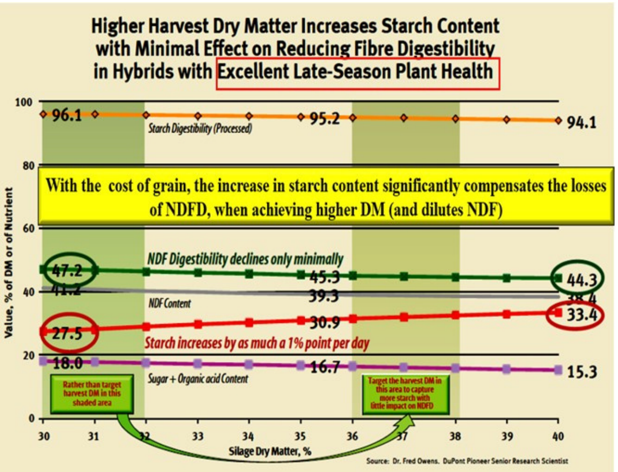
From the animal requirements define the target for quality or yield and feeding values.

- Protein
- Energy – starch
- Digestibility
- Total DM Yield

Why Maize Silage?

- Source of readily digestible fibre, nutrients and starch for ruminants
- Fermented feeds conserve high nutrient values
- Quality maize silage can increase energy density in the diet
- Key to success is to manage palatability, physically effective fibre and starch availability without compromising
- Silage fermentation quality
- DM intake
- Animal health

The maturity stage at harvest has an impact on the nutritional value of different hybrids.



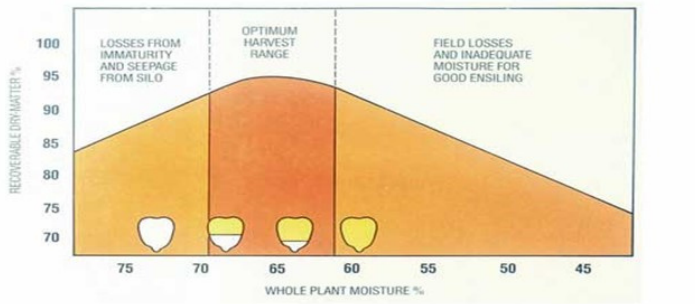
Sources of energy in maize silage

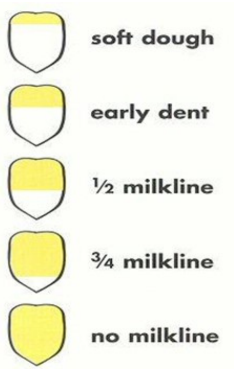
- 65% grain
- 10% Cell Contents
- 25% NDF (fibre)

The increase in starch content is responsible for the main quality improvement.

Plant component	% of DM @32%
Grain	46
Stalk	23
Leaf	11
Cob	11
Husk	9

Kernel development





Maturity and planning at Maize Silage harvest

- It is common to lose 0.5-1% moisture per day at grain fill coming to harvest
- It is also common to increase 0.5-1% in starch per day, until black layer
- 5-10 days per milk line depending on location and environment

Corn Season Challenges – What if events?

- First reaction should NOT be cut it tomorrow!!
- Drought conditions
- Lack of water or high cost prevents last irrigations
- Desperate for feed and want to cut early
- Insect attack
- Frost
- Hail damage, cyclone
- Nitrates
- Assess crop, gather information.
- DM of whole plant, soil moisture, plant health, pests, damage contamination etc
- Make new management plan
- Extract as much of the crops full potential as possible in the new circumstances

Forage Sorghum

Less intensive to grow than corn with different hybrids providing a range of different outcomes;

Forage sorghum that produces grain heads.

Forage Sorghum that produces grain are grown as a grain crop and harvested at the dough stage (similar to Maize).

Focusing on the grain content to maximize starch yield providing a feed that contains both grain and plant material.

Forage sorghums designed to be intensively managed.

Forage sorghums designed to be utilized in the vegetative phase of growth can also provide a higher protein and sound energy content feed when conserved at an earlier stage. Can be more intensively managed.

These crops generally require mowing and wilting to make silage.

These crops are often grazed, however if the crop's growth stage is at risk of advancing past the vegetative stage or stem elongation reduces the leaf to stem ratio (approx 1 to 1.2m high) then silage can be made.

Some hybrids are suited to multiple cuts of silage. Late harvest may result in a loss of quality as plant stover to leaf ratio increases and the fibre and becomes less digestible.

Crops left to grow out may not dry down enough to be direct cut and become unmanageable to mow and wilt to correct DM.

Direct cutting of these varieties at too low DM risks effluent loss from the silage and undesirable compounds being produced in the fermentation along with high shrinkage of silage.

Prussic Acid

Sorghum silage is generally safe for feeding. Although it could contain toxic levels of prussic acid if cut early or stressed plants. Well fermented and ensiled for 3 weeks reduces levels of toxin by approximately 50% as much of the poison escapes as a gas during fermentation and when being moved for feeding.

Extra Ensiling Challenges to Consider

- Purchasing crop - logistics long haulage distances
- Expect all crops have contamination and potential for increased epiphytic bacteria.
- Has effluent or manure been used on the crop?
- Potential for excess Nitrates or other compounds,
- Compromised crops – environmental factors
- Check chemical use withholding periods.
- Consider any feeding challenges that can impact on animal health and production.

Notes...

SUPPORTED BY HYBRID-AG SCIENCE • LAWS OF NATURE, SCIENTIFICALLY PROVEN • PHYSICAL • MINERAL • BIOLOGICAL

Healthier food starts with healthier soil

Since the very beginning, we've been pulled by a vision of creating better food that supports human health. And through staying true to that vision – we are constantly expanding our knowledge and innovating our methods, increasing the transformative results we are able to achieve.

Educate

We share our knowledge about the science of soil and plant health and nutrient dense food with growers, agronomists, and consumers.

Apply

We apply the learnings to the land - working closely with our network to innovate, improve our methods, and achieve better outcomes.

Transform

We work with passion and precision to transform food nutrient density as we know it today.

Contact our our Pasture & Broadacre Specialist:
Andrew Sneyd
P: +61 403 468 814 E: asneyd@hybridag.com.au

HYBRID AG

Test, Don't Guess.

Hybrid-Ag introduces the Differential Sap Analysis for Broadacre Crops.

Hybrid-Ag have been using Differential Sap Analysis (DSA) in horticulture for over three seasons. This method has been used effectively in broadacre crops across the globe for over 12 years with excellent results and we are excited to launch it here in Australia.

This unique test, which uses the sap from the plant leaf, can show not only the nutrient status of the plant, but enables our Agronomists to be able to detect nutrient imbalance and correct these before deficiency symptoms appear in the plant.

The DSA test varies from the current method of using the petioles to extract sap. Instead, the DSA test uses the newest formed leaf and the second or third mature leaf of the plant. The newest formed leaves are collected in a plastic bag and labelled as the young leaf. The more mature leaves are collected in a separate plastic bag and labelled old leaf.

These two separate bags make up one sample. The sap is extracted from the sample and graphed to show the level of each nutrient and the direction of flow of the nutrient in the sap.

To effectively collect a sample; we need to pick dry leaves and have at least 80g of functioning green sap filled leaves and no stems in each bag. When enough leaf has been gathered, remove as much air as possible from the bag and seal it. The bags need to be kept cool but not frozen and sent to Hybrid-Ag as soon as possible.

The sap extraction has been developed by an enterprise that is regarded as the best in the world in sap analysis and laboratory practice.

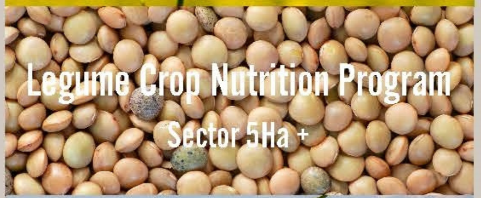
This company was established in 2008, and conducted their first analysis in the beginning of 2009. Starting with a background in soil improvement, Albrecht, nutrition and soil biology they focused primarily on soft fruit and vegetable crops before broadening into greenhouse and agricultural field-grown crops.

The whole process takes between seven and ten days between picking the leaves to discussing the results with a Hybrid-Ag Agronomist.

The Benefits of the DSA test:

- Being able to see, not only the levels of each nutrient, but also the direction of the sap flow. This allows us to see if there are any imbalances in the nutrients which maybe a precursor to disease or insect attack well before symptoms appear.
- Nitrogen and phosphorus are the big drivers of yield. The plant also needs all the nutrients to be in balance to photosynthesize and process amino acids and sugars into protein. When the plant has the right balance of nutrient and water it can resist fungal disease and insect attack. It can also prevent lodging and head loss in cereal crops.
- Farmers worldwide are now examining methods to reduce reliance on synthetic fertilizers and chemical control of insects and fungal disease. DSA testing offers farmers a chance to correct nutrient imbalance and get their crops functioning at levels of plant health that minimize the impact of plant disease and insect attack.

Programs available for 2022:



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