Learnings from the 2024 season

The 2024 season was the 'driest ever' GSR (growing season rainfall) for many clients

Calibre wheat sown on the 4 June sown wheat at the Hart Field Day.

- So what learnings do we take away from that? ... be cautious in making drastic changes based off one season, as this year was largely 'out of the box'. It has even been difficult to draw reliable conclusions from trials given how much background variability and season long moisture stress there was in many regions.
- A reminder that Decile 1 rainfall for the growing season, means that in 90% of previous seasons, the GSR was higher than this year. Many places didn't move off Decile 0 or 'driest ever on record'. A Decile 0.5 season means that it is the driest 5% of years ever, with 95% of previous seasons receiving more rainfall... just to put things into perspective!
- … the long term forecast was very wrong! It's a reminder we need to be conscious of pinning too much on a forecast, as they are only part of the picture (along with rainfall-to-date, stored moisture, and crop development).

MOISTURE CONSERVATION IS KEY, but in some places even the best management couldn't prevent crop failure

- This year was one of the clearest examples, and strongest business cases for protecting stored soil moisture, at all costs. Even the most reliable farming areas suffered through the dry winter and spring.
  - Summer spraying is the most obvious management strategy which showed up significant yield gains this year. Any delayed summer spraying from the 2023/24 summer, and even the 2022/23 summer, resulted in noticeable yield differences this year.
- Stubble cover undoubtedly helps to retain moisture over summer, and was especially found to increase lentil yields through added protection and moisture conservation. Any stubble removal activities (straw, burning, heavy grazing, speed tilling or discing) cost yield this year due to increased evaporation.
- Where crops made it through to harvest, unscathed by frost, there were some record breaking WUE (water-use-efficiencies) achieved. Where normally we are happy to exceed 12kg/ha/mm, this year WUE numbers have nudged closer to 20kg/ha/mm (where un-frosted). This was especially noted on lighter soil types, where crops emerged earlier, and more efficiently utilized moisture from smaller rainfall events, compared to heavier soil types.
- Another standout was clients with sandy country that had recently have undergone amelioration such as deep ripping, spading or delving. There continues to be significant yield gains in these areas, as soil constraints are delt with, and plants can access deep moisture and nutrients. This year ameliorated sands didn't come without their establishment challenges, especially where stubble cover was limited.

A common sight, wilting canola near Freeling, on 14th August

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- This year was a true testament to how far farming practices have progressed in a few short decades. Modern agronomy and farming continues to amaze us, and we congratulate everyone on the achievement of having a crop to harvest at the end of 2024.

Rotations and paddock history showed up significant differences

- Any cereal on cereal, or cereal on canola paddocks struggled this year from lower levels of stored soil moisture carried over from 2023. Where we saw side-by-side comparisons, there was anywhere from a 20-50% yield penalty when comparing a cereal/canola crop sown on a cereal/canola stubble vs a pulse stubble.
- Barley crops struggled in general, with a high proportion of failed paddocks. This was a combination of multiple factors including that nearly all barley paddocks following a cereal or canola; barley tended to have less drought resilience compared to wheat; was impacted by boron toxicity in some areas; and also was hit by a late flowering and grain fill frost.
- Wheat held up better than barley, and was able to more effectively reduce head size, grain number and tillers through the dry conditions in August and September. This, along with coolish spring conditions, resulted in mostly excellent grain size and sample quality in wheat.

Lentils are resilient!

- Majority of lentil crops struggled to achieve canopy closure this year, but despite the low biomass, surprising yields were achieved!
- Lentils have an amazing ability to conserve moisture through winter, build a strong root system, and then flower and set pods through dry and warm spring conditions.
- Around the 17th of September, many lentils crops throughout the state copped a significant vegetative frost event, sending many paddocks and patches of crops, a lime green / white tinge. Luckily many crops hadn't podded yet, and made a triumphant recovery, reflowering and podding despite minimal rainfall. There appeared to be variety differences between vegetative frost damage, with GIA Thunder and GIA Lightning lentils faring better than Highland XT.

Severely frosted lentils near Pinery, 20th September. The crop made a remarkable recovery.

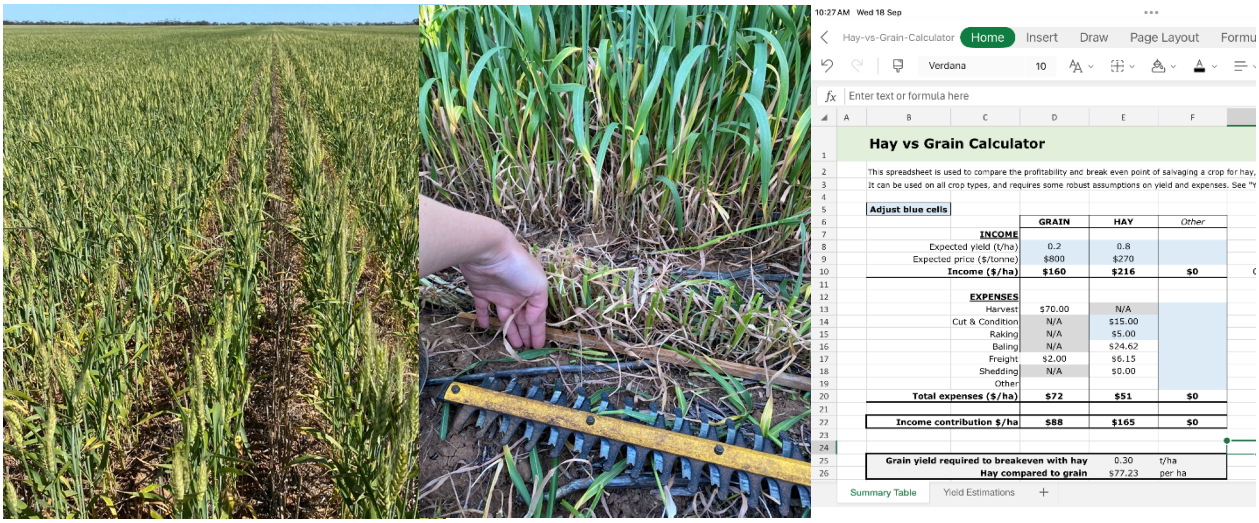
Dry seeding in 2024 saw highly variable and uneven crop establishment… perhaps worst ever?

- With Decile 0 rainfall for March, April and May, this year saw the largest dry seeding program across the state, perhaps ever? Even when the 'rains came' most places only got single digit rain events in June (and July), and paddocks never had a chance to properly wet up.
    - Firstly, it was amazing how long seed will sit in dry soil before germinating. There really weren't too many situations of rotted seed (as it was so dry!) or false germinations.
    - However, sowing depth and seed placement was a major issue. Heavy soils came up cloddier than ever, and seed was dropped to significant depth (5-10cm), which made for a very slow emergence. Disc seeders were the exception, and achieved impressive crop establishment through accurate seed placement.
    - It was a particularly poor year for crop emergence on non-wetting sands, regardless of seeding system.

Frost took it's toll

- After getting through winter (June, July and August) relatively 'safe' from any major frost events, the inevitable September frost event(s) was the 'dagger' to the chest after the dry season.
- There were many tough 'hay vs grain vs graze' decisions during this time, and it showed just how important it is to have a sounding board to help work through these numbers objectively.
- With the late break and poor biomass, predicted hay yields were low, and hay making was made difficult due to paddocks not being set up for hay (unrolled, and many clods still present).

- Generally, cereal hay quality was good if baled prior to October rains, and canola again showed that it can be salvaged into quality hay if cut early enough during flowering.
- Compared to other recent dry frosty years (2018 and 2019), making lentil hay in the Lower North was much less attractive this year, due to low biomass crops, and strong lentil grain pricing. Most lentil crops recovered surprisingly well from the frost events too.



Severely frosted wheat, and hay cutting decision making tools.

Weed control

- There was significant re-shuffling of planned pre-emergent herbicides due to the dry seeding conditions. Some herbicides like propyzamide were shifted to PSPE (post sowing pre emergence) use patterns, whilst most of the cereal pre-ems were left up-front or IBS (incorporated by sowing). Largely we found that the pre-ems were stable in dry conditions, and didn't 'disappear' after sitting dry in the soil for several weeks. However, poor weed control results did come from the lack of a decent opening rain event in June. Herbicide such as Sakura® need at least 10mm of rain to be washed off the stubble and into the soil, which unfortunately wasn't achieved until late July in many areas. There was still just enough rain for weed emergence, and there certainly were some significant ryegrass burdens, with seedbank carryover expected to still be from the 2022 season.
- Due to variable crop emergence, it was one of the trickiest post emergence periods for weed controls. The mixed growth stages made timing phenoxy products (MCPA, 2,4-D, and dicamba) difficult, but this also allowed for a rotation of other post emergent sprays in cereals (mostly with bromoxynil) with wider application timings.
- Capeweed and medic thrived from the dry seeding conditions, along with large woody marshmallow left over from summer. This made for some more tricky post emergent sprays, especially with variable crop stages.
- Keep in mind that the weed seed set after this year will be low. It is unlikely that weed seeds set in a year like this will lead to a blow out situation, so don't stress about a few weeds slipping through the cracks. Ryegrass seed set will also be lower, with even ryegrass suffering through dry conditions in September.

Imi herbicides – be wary in a dry season

There are multiple reasons to be wary of imidazoline herbicides in a dry season;

1. Carryover effect (plantback) from the previous year can be exacerbated in a dry season, especially where crops are moisture stressed. After the dry growing season in 2023, followed by multiple summer rainfall events in November and December, there were a few 'borderline' imi residues to deal with. Mostly, we took a

cautious approach and sowed Clearfield® crops this year. However, there were a few situations where non-Clearfield® crops went on imi residues, and crop appeared to be visually imi affected.

2. Using imi's in a dry year, can cause crop effect, especially on lentils. This year was a clear reminder how much imi herbicide use can stunt crops, especially lentils. A lot of imi's went out on lentils this year, due to the dry start and high broadleaf weed burden. Where crops were not stressed, and actively growing, little crop effect was seen, however, any late applications or applications on stressed plants knocked crops around for a couple of weeks, or even longer.
3. Less in-season rainfall following an imi application, will cause plantback issues for the following season. This is a reminder to be extremely cautious in dealing with imi plantbacks going into 2025. In-season winter and spring rainfall is more effective at breaking down residues, and summer rainfall needs to be effective at keeping the soil moist for 1-2weeks if it is counted for herbicide breakdown. Remember to also be wary of imi applications from 2023, especially for non-Clearfield® canola which requires a 34month re-cropping interval.

Durum wheat impacted by Intervix® carryover, shown worse on overlap.

Stripe rust can survive (and thrive) in a dry season

- Despite the below Decile 1 season, stripe rust hotspots began to appear in August across the state. Most of the severe cases were in susceptible (S) and very susceptible (VS) varieties, with no fungicide protection or flutriafol used at seeding. Sheriff CL and Vixen are particularly susceptible (S), followed by Soaker (MS), Calibre (S), Tomahawk CL (MSS), Scepter (MSS) and Razor CL (MRMS).
- Flutriafol proved to be a very useful tool to prevent early infection, with crops staying clean until well into stem elongation before a fungicide was needed.
- This year certainly was a reminder that stripe rust does not need rainfall to thrive. Cool (20°C) and dewy conditions overnight is enough for the fungi to spread throughout a crop canopy, even if the days are warm and dry. Despite progressing through the crop canopy, it didn't really 'take off' and yield loss from untreated paddocks was minor, especially in low yielding crops.

Nitrogen management

- Most crops across the state were 'over fertilized' in 2024. Despite this, there have been very few reports of 'haying off' in wheat crops, given the ability of wheat plants to reduced grain numbers, and the relatively mild spring conditions.
- The ability to utilize flexible fertiliser storage this year was a real winner. Whether it was storing on-farm or leaving in a bulk storage facility, it meant that there wasn't a need to spread left-over urea… just for the sake of getting rid of it! We encourage looking into options for flexible fertiliser storage, as it certainly has benefits in both lower and high rainfall seasons.
- As a result of significant unused nitrogen this year, we expect high levels of carryover nitrogen (and phosphorus) for next year, following cereal and canola crops. We predict that deep nitrogen levels following pulse crops will be low, given poor biomass growth.

Very low pasture growth requires careful livestock management

- Given the late start, and lack of an opening rain, pasture growth was exceptionally low this year.
- Having the option to containment feed was imperative this year (and in most years). Containment feeding means that paddock cover was protected in autumn and early winter, and allowed for some form of pasture growth before pastures were grazed from July onwards.
- However, given that some hills and paddock grazing options barely lasted a couple of months, and there is now minimal feed available in this year's cropping stubbles, livestock numbers and the summer feeding strategy needs

to be carefully considered going forward. Supplementary feeding stock for a long stretch of time is a significant cost and time burden, and needs to be carefully analyzed to ensure your time and money is justified. Many clients have been gradually reducing livestock numbers, and should be looking at this again over summer.

Oats crops were the first to die, hay yields were minimal

- This year was again a reminder just how soft oats can be in dry, warm and windy conditions. There were the 'first to go' when crops showed severe moisture stress in late August / September, with many crop browning off well before head emergence.
- The decision of: "Do I cut now whilst there is still some green leaf, or wait till the head is out to help with curing?" and "Is this even a viable hay crop?" were both widespread issues. Plenty of oat crops didn't get cut for hay, and were left for grain or grazed off.
- Any half decent oaten hay crops were rare this year, but if sold into the domestic market, some handy returns were generated, given the short supply of oaten hay.

Oaten hay loosing green leaf

Impressive root growth from deep ripped sands (LHS).

Propyzamide missed strip showing up despite the dry conditions for herbicide activation.

Increased vegetation frost damage in Highland XT lentils (LHS) vs GIA Lightning (RHS)