Grower Update

ISSUE 39 – OCTOBER 2020

Burdekin Productivity Services

PRODUCTIVITY PROFITABILITY SUSTAINABILITY

Funded by Burdekin Canegrowers and Wilmar Sugar

Welcome to the October issue of our BPS newsletter. We hope you find the articles contained in this issue informative.

This issue contains:

Approved Seed Cane Subsidy

Approved Seed Cane Plots Update

Seed Cane Distribution Flow Chart

Crop Nutrition – Potassium

Soil Testing – Frequently Asked Questions

Pest in Focus - Soldier Fly

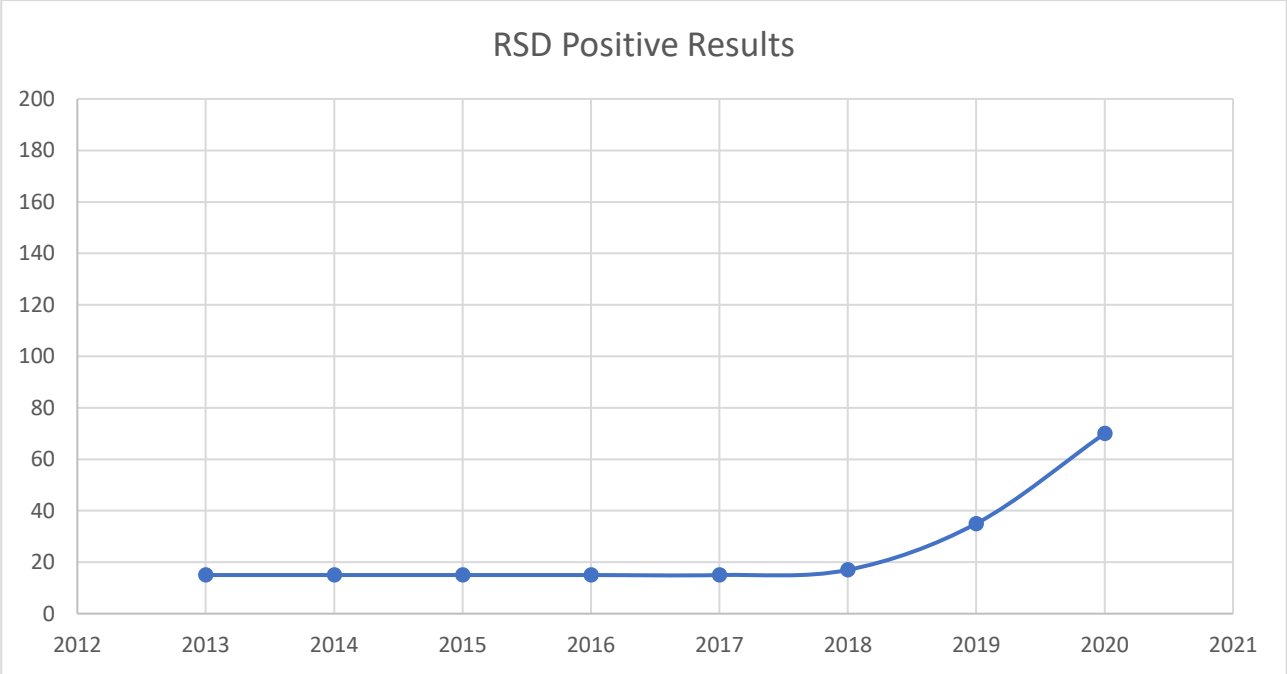
2019 Productivity Award Winners

Soybean Diseases

Staff Contacts

APPROVED SEED CANE SUBSIDY OFFERED TO BPS MEMBERS

The BPS Board announced a one-off approved seed cane subsidy at our recent AGM. There were a number of motivating factors for this decision, however the highest priority reason was to increase the volume of approved seed cane being purchased by growers in the district, particularly in light of increasing Ratoon Stunting Disease (RSD) being detected in the district. See the graph below which shows the number of RSD positive blocks over the region was steady for around 5 years, then has increased over the last 2 years.



RSD can be controlled quite simply: ensure fallows are free from volunteers, sterilise machinery, and regularly purchase approved seed cane. If we all do our bit we can control the increase of spread of RSD very rapidly. BPS staff are available to assist growers with management of RSD and other diseases on your farm. With the subsidy available for next year (2021), the BPS Board hopes to encourage all growers to purchase approved seed cane.

Given there might be a reasonable demand for approved seed cane next season, the following approach will be followed:

- Subsidy of $10/t of approved seed cane will apply to all BPS members for the 2021 year only
- Your invoice will be discounted, and you will pay $10/t less than the full amount, and BPS will cover the difference to plot owners so they are not out of pocket.
- Up to approximately 10 000 t of seed cane is available for the 2021 season
- **To ensure your desired volume can be reserved, orders must be submitted to your BPS Field officer no later than Fri 26th Feb 2021.**
- Orders placed after 26th Feb cannot be guaranteed
- If orders placed by 26th Feb exceed availability, then orders and volumes will be allocated/restricted based on Ha of BPS levies paid.

We suggest that 1% of your farm area is planted every year to approved seed cane to minimise disease pressure and maximise productivity potential. Please contact your BPS Field Officer and place your order for subsidised seed cane as soon as possible.

APPROVED SEED CANE PLOTS UPDATE

Burdekin Productivity Services Ltd (BPS) has 9 Approved Seed Cane Plots in operation for 2021. There are 3 types of approved seed plots.

1. Combined Mother and Distribution plots (shown in green)
2. Distribution plots (orange)
3. Mother plot (pink)

The chart below lists each of these plots and includes details of ownership, who acts as plot holder, and management arrangements. Also included are the areas under approved cane as plant or first ratoon and areas under fallow.

BPS is anticipating a solid uptake of the new variety for 2021, SRA23, and WSRA17 which was released in 2020. There are good plantings of each variety in all plots.

Burdekin Approved Seed Cane Plots - 2021

Type	Plot Name	Location	Owner	Plot Holder	Management	Area					
						MP Cane	MP Fall.	DP Plant	DP 1R	DP Fall.	Total
Mother and Distribution Plot	Inkerman	Home Hill	Inkerman Cane Growers	Inkerman Cane Growers	Farm manager employed	5	5	23	23	23	79
	P & K (Pioneer & Kalamia)	Ayr	PCGO & Kalagro	PCGO & Kalagro	Farm manager employed	3	3	21	21	21	69
	Brock Rd	Clare	AgForce Cane, leased to BPS	JJB Farming, subcontracted to BPS	JJB Farming	2	2	7	7	7	25
	Rocks Farming *	Rocks	Rocks Farming	Rocks Farming	Rocks Farming	1		7			8
Distribution Plot only	Rapisarda *	Clare	Rapisarda	Rapisarda	Rapisarda			8			8
	Millaroo	Millaroo	AgForce Cane, leased to BPS	Cervoni Farming, subcontracted to BPS	Cervoni Farming			2	2	2	6
	Giru	Giru	Lyons	Lyons	Lyons			7	5	6	18
Mother Plot only	Christensen	Ayr	Christensen	Christensen	Christensen	2	2				4
Total						**13**	**12**	**75**	**58**	**59**	**217**

*Floating plot – new location each year

Production at the Burdekin Approved Cane Plots during 2021 is estimated as follows:

Mother Plot Cane – 13 Hectares @ 80t/Ha = 1040t (for planting distribution plots, mother plots and variety strip trials)

Distribution Plot Cane – 133 Ha @ 80t/Ha = 10 640t (for sale to growers as approved seed cane)

Note: Mother plots are full stick planted after hot and cold water treatment

Distribution plots are billet or full stick planted – no water treatment

SEED CANE DISTRIBUTION FLOW CHART – NEW VARIETY

The SRA Plant Breeding Program identifies the most likely variety/s for release to industry and prepares a small quantity for BPS

Year 1 - Isolation Plot

New variety is hand cut, stripped and loaded onto 1.5 tonne crates and soaked in cold water for 40-48 hours at BPS. This is followed by soaking for 3 hours at 50 degrees.

This is to reduce the risk of transmitting leaf scald, chlorotic streak and ratoon stunting disease (RSD) for all new varieties being released

Cane is then planted into an Isolation Plot separated from commercial cane blocks.

The Isolation Plot is inspected regularly by BPS Staff to ensure that no genetic variation or diseases are present. This includes walking the plot and conducting RSD sampling.

Year 2 - Mother Plot

The cane is hand cut from the Isolation Plot and stripped then loaded onto crates.

The new variety is cold soaked for 40-48 hours then transferred and soaked in hot water at 50 degrees for 3 hours.

Cane is then planted into an Approved Mother Plot.

The Mother Plot is regularly inspected by BPS Staff to ensure that no genetic variation or disease has occurred in the new variety or other varieties planted in the plot. RSD sampling is conducted.

Year 3 - Distribution Plot

The cane is cut from the Mother Plot and planted into the Distribution Plot.

The Distribution Plot is inspected regularly by BPS Staff to ensure that no genetic variation or disease has occurred in the new variety or other varieties planted. RSD sampling is conducted.

Year 4 - Distribution

Approved seed cane is sold from the Distribution Plot to growers.

IMPORTANT INFORMATION

BPS does not set the price of seed cane that is sold from the plots. The Plot Owner sets the price and retains all proceeds from seed cane sales.

BPS covers the cost of:

- Plot planning, weighbridges, inspections and sampling
- Organising sales and administration of seed cane accounts
- Funding additional mother plots
- Funding isolation plot
- Treatment of cane – operating hot and cold water treatment tanks

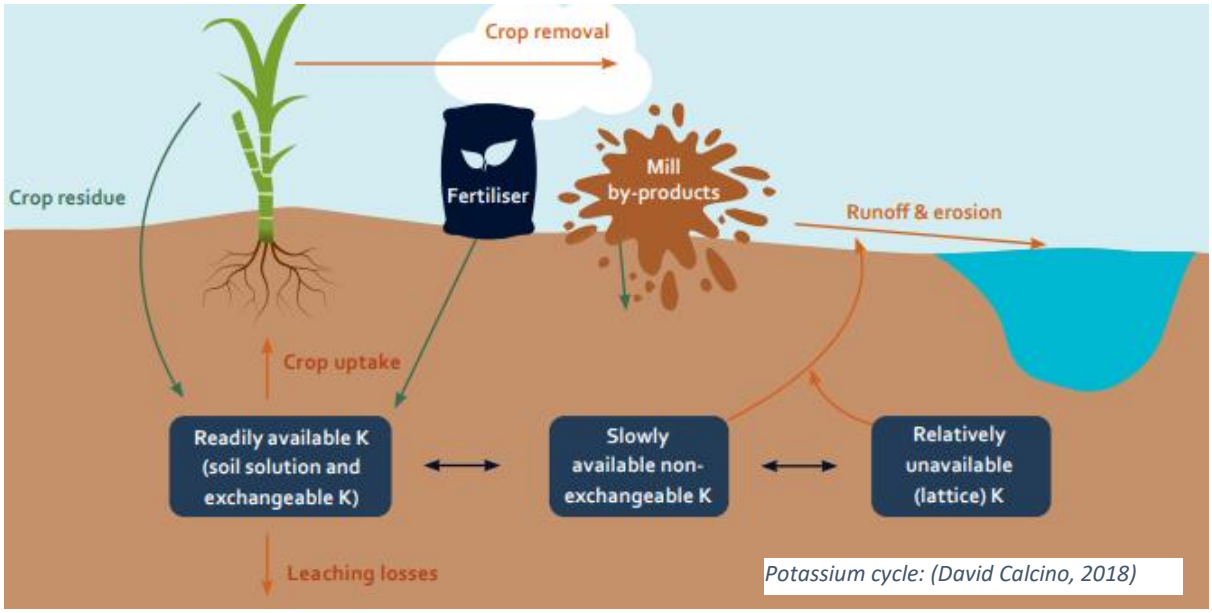
CROP NUTRITION - POTASSIUM

Potassium, or potash as it is commonly known, is one of the macronutrients and it plays a critical role in plant growth. Potassium performs many roles in plants such as: helping water and sugars to move throughout the plant; improving flower quality; and controlling a plant's osmotic pressure and cell thickness leading to stronger plants that are then less susceptible to diseases (Coleby-Williams, 2015). In sugarcane, the main roles of potassium are: controlling the formation of starch; promoting root growth; and preventing early cell death in plant tissue (David Calcino, 2018).

Not or under applying potassium can lead to deficiencies. Potassium deficiency symptoms resemble salt burn e.g. dead areas or yellow/brown/red stripes along leaf edges and between the leaf veins. Symptoms will show first on older leaves. Applying excess potassium is also not recommended as it can lead to increased ash content in juice and reduced recovery of sugars, without any increase in sugar yield or CCS.

There are large amounts of potassium in the earth's crust, but most of it is in the form of rock and therefore unavailable. Potassium is added into soil through crop residues, mill by-products and synthetic fertilisers. Potassium is a key element in fertilisers and comes in varying forms, crystal, granular and liquid (Coleby-Williams, 2015). If high amounts of potassium (>50 kg/ha) are applied at planting directly on top of the sett, the result can be sett burn (damage of the new roots and shoots). The way to avoid this is to check that the planter is applying fertiliser banded and 5 cm below the sett. Commonly planting blends apply a low rate of potassium, to avoid this issue.

There is some leaching risk associated with potassium, particularly in sandier soils; on the other hand, in clay soils it can be tightly bound and unavailable to the plant. Some nutrients like potassium are cations which means they are positively charged, while clay and organic matter are negatively charged. Therefore, like magnets, they are attracted to each other. In high cation exchange capacity (CEC) soils - typically those with high clay or organic matter levels - nutrients with positive charges are less likely to be lost through leaching.



Potassium cycle: (David Calcino, 2018)

On soil tests there are two important potassium readings, nitric potassium and exchangeable potassium. These are used with the soil texture class to create a recommendation.

Nitric potassium: is shown on most soil samples as Nitric K cmol(+)/Kg, and is a measure of soil stored/slowly released potassium. Up to 10% of total soil potassium is slow release, commonly we use the term "fixed" because it is bound between layers of certain clays in the soil profile (David Calcino, 2018, p. 58).

Exchangeable potassium: is shown on soil samples as Potassium (Amm-acet.) cmol(+)/Kg; this is a measure of plant available potassium. This test indicates if there will be a plant response to applied potassium. (David Calcino, 2018, p. 58)

The soil texture classification which is found on your soil sample is also used in combination with the analytes above to decide which potassium rate is applicable.

How do we put this into action using the Six Easy Steps guidelines?

Use the following numbers from your soil sample:

Analyte	**Value**
Potassium (Nitric K) cmol(+)/Kg	2.5
Potassium (Amm-acet.) cmol(+)/K	0.21
Soil texture	Clay
Rate according to Six Easy Steps table below:	100kg/ha of potassium is required.

Table 33 POTASSIUM RATE RECOMMENDATIONS – BURDEKIN

Plant, Replant and Ratoon (kg/ha K)

Nitric K (meq/100 g)	Exchangeable K(amm-acet) - meq/100 g					
	<0.20	0.20-0.25	0.26-0.30	0.31-0.35	0.36-0.40	> 0.40
< 0.70	100 (sand)	80 (sand)	50 (sand)	50 (sand)	Nil (sand)	Nil
	120 (loam)	100 (loam)	80 (loam)	50 (loam)	Nil (loam)	
	120 (clay)	120 (clay)	100 (clay)	80 (clay)	50 (clay)	
> 0.70	80 (sand)	50 (sand)	Nil (sand)	Nil (sand)	Nil	Nil
	100 (loam)	80 (loam)	50 (loam)	Nil (loam)		
	100 (clay)	100 (clay)	80 (clay)	50 (clay)		

Modifications to potassium application rates where mill by-products have been used:

- Mill mud applied at 200 wet t/ha: Subtract 50 kg K/ha on the first crop after application.
- Mud/ash mixture applied at 200 wet t/ha: Apply nil K on the two crops after application.
- Ash only applied at 200 wet t/ha: Apply nil K for the three crops after application.

Modifications to K rate are recommended where blocks of sugarcane are irrigated with ground water which may contain substantial amounts of potassium. The K application needs to be reduced to take this source of K into account.

Table 1 Potassium rate recommendation table (David Calcino et al, 2018, p. 61)

Healthy cane leaf (Gujarat Bio Organics Pvt. Ltd., n.d.)

Potassium deficiency (Aries Agro Ltd)

SOIL TESTING – FREQUENTLY ASKED QUESTIONS

When do I need to get a soil test?

Current regulations state that you need to get a soil test for each block *prior* to planting cane. This test needs to have been taken no more than 12 months before planting cane. Don't leave it too late / close to planting to get a soil test because it takes 3-4 weeks for samples to be tested and recommendations developed.

If you are growing a legume (or other fallow crop), then you can get the soil test prior to planting the legume, or after the legume is harvested and *before* cane is planted.

The soil test taken before planting can be used to develop nutrient recommendations for the ratoon cycle.

How do I choose where to get a soil test from?

For the best value, a soil test needs to be representative of the block it is being taken from. This means avoiding areas that are different e.g. different soil types; areas known to waterlog; areas where mill mud has been applied (if it has not been applied to the whole field); areas of excessively good or poor growth compared to the rest of the block, etc.

What if I have different soil types in a block?

If there is one main soil type and only a small area of a different soil type the sample should be taken from the main soil type.

If the different soil types take up similar percentages of the block e.g. 40% of one soil and 60% of another, the best practice will be to sample these areas separately. A composite sample is okay, but might hide differences between the sites.

Can I use a soil test to diagnose problem areas?

Yes. In this case the best option is to take a sample from the problem area and a second sample from the rest of the block. This will show up any nutritional differences between the two areas; but it will not indicate if there are physical constraints such as compaction affecting growth. Often there are minimal nutritional differences in the top soil and it may be more beneficial to take subsoil (20-50 cm) tests when trying to diagnose a problem.

What information is needed to develop a nutrient recommendation?

1. Crop class – whether it is fallow plant, plough-out replant, or ratoons. For the purposes of the Reef Regulations, plough-out replant is defined as a fallow period of less than 6 months from the harvest of one cane crop and the planting of the next.
2. The district potential yield – in the Burdekin there are two district yield potentials, 150 t/ha and 180 t/ha. If you have records showing that you have blocks that have cut more than 150 t/ha in 3 separate years in the last 15 years you can use the 180 t/ha yield potential.
3. If any fallow crops have been grown - what they were e.g. soybean; and how they were managed i.e. whether the grain was harvested or if it was a green manure crop.
4. If lime or gypsum has been applied in the last 12 months and the rate of application.
5. If mill by-products have been applied in the last 12 months and the rate of application.
6. Any other issues that are specific to that block or fertiliser management - e.g. can only apply liquid products at planting; would like to split ratoon applications; block has been levelled etc.

SOLIDER FLY

Solider flies are a sugarcane pest which live in northern, central and southern Australia, including the Atherton Tableland and the Burdekin. In the Burdekin soldier fly is found in small areas of Jarvisfield and Rita Island.

Soldier fly larvae live in the surface layers of the soil (within approximately 15 cm of the surface) where they feed on cane roots. The larvae cut off the fine root hairs and burrow their heads into the roots as they feed, reducing the plant's ability to take up water and nutrients. Poor ratooning, caused by damage to the underground buds, is the most common symptom.

Small numbers of soldier fly can cause significant damage. Not a lot is known about why they can cause such severe damage, but one theory is that they inject toxins into the plant as they feed. These toxins are thought to penetrate the root hairs and inhibit crop growth. More research is underway to investigate this theory. Venom proteins, similar to those found in plant parasitic nematodes, have also been isolated from the salivary glands of soldier flies. The role of these proteins in causing crop damage is also being investigated.

Soldier fly damage on sugarcane crop (Ward, 2019).

There are two known species of soldier fly, Sugarcane soldier fly, *Inopus rubiceps,* and Yellow solider fly, *Inopus flavus.* Yellow soldier fly is present in the Burdekin. Recent genetic profiling has identified another 4 species, one of which is specific to the Burdekin.

Soldier flies do not have a soil preference and they inhabit soils from red volcanic soil to sandy alluvial soils. Yellow solider fly, in particular, like drier soils, however they also live in medium texture soils (P.G Allsopp, 1997).

Natural and cultural controls are the main management options. Various insecticides are being evaluated, but nothing is currently registered. Other soil insects such as wireworms and ground beetles are important predators, and the fungal disease *Metarhizium* will also help to control soldier fly populations.

Key cultural controls are:

Take out affected blocks early and maintain a grass free fallow or grow a legume break crop. This removes the food source (grass roots) while the larvae are still small and they will eventually starve.

Plant after the adults fly. Adults are less likely to lay their eggs if there is no food source available (sugarcane or other grasses) during the flight period.

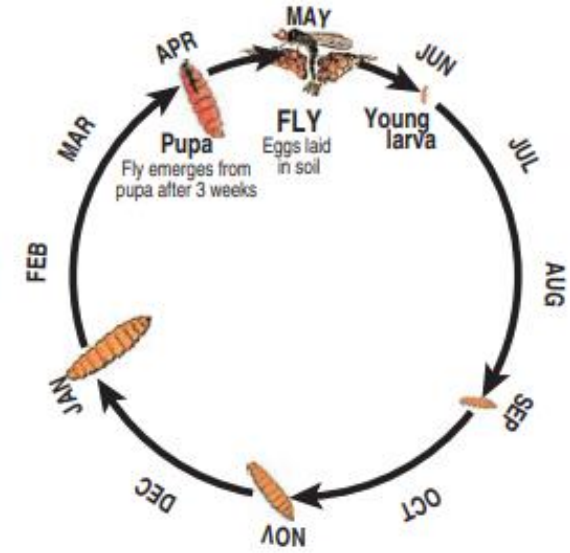
Avoid excessive cultivation as this will destroy the natural predators, while having little effect on the larvae themselves.

Soldier fly lifecycle:

Adult flies emerge from the soil between March and July. The females mate, lay their eggs and die within 1-2 days of emergence. The flies generally lay their eggs close to where they emerged from.

Eggs are laid 10 mm below the surface or between soil and dead plant matter in groups of 200. These eggs then hatch 1-3 weeks after being laid, depending on temperature (P.G Allsopp, 1997).

The larvae feed on the roots of grasses and sugarcane before pupating. The pupal stage lasts about 3 weeks, then the adults emerge to start the cycle again.



Soldier fly lifecycle, (Sugar Research Australia, 2013).

Description:

Yellow solider fly: Adult females are approximately 12 mm in length, with light grey wings and yellow-orange legs and head. Adult male are approximately 8 mm long, the body is mostly black with big black eyes, only the legs are yellow (P.G Allsopp, 1997).

The larvae range from 1 mm at hatching to 12 mm when they're fully grown. They have a tough skinned, segmented body that is white to brown in colour with hairs on each segment.

Close up of soldier fly larvae (Pfeffer, 2018).

Soldier fly larvae in the paddock

For more information see the SRA Soldier Fly Information Sheet or contact any of the BPS staff

https://sugarresearch.com.au/wp-content/uploads/2017/02/IS13075-Soldier-fly.pdf

2019 PRODUCTIVITY AWARD WINNERS

Productivity awards for the 2019 season were presented at the recent BPS AGM. BPS would like to congratulate all of the winners for some outstanding achievements.

This year saw a change in the awards that were presented. Rather than having a single award across the Burdekin, the highest farm CCS and farm tonnes cane per hectare were selected for each mill area, along with an overall Sugar Producer of the Year award.

The winners in each category were:

Highest Average Farm CCS for a farm over 25 hectares

Inkerman: V Sorbello and Company - 16.34 CCS

Invicta: CJ & KJ McNee – 16.81 CCS

Kalamia: Brett Delle Baite Trust – 15.89 CCS

Pioneer: DRV Cox – 16.55 CCS

Highest Average Farm TCH for a farm over 25 ha and less than 28% plant cane

Inkerman: F & FJ Vigerzi – 160.6 t/ha

Invicta: Melmac Farming Pty Ltd – 154.7 t/ha

Kalamia: Dongamere Farming – 161.7 t/ha

Pioneer: Giddy Harvesting Co – 154.9 t/ha

Sugar Producer of the Year, highest farm TSH for a farm over 25 ha and less than 28% plant cane

Frank and Fleur Vigerzi – 23.2 t/ha

Top Row (L-R): Brett Delle Baite, James Cunningham (for V Sorbello), Barry Breadsell (for Dongamere)
Bottom Row (L-R): Frank Vigerzi, David Christensen (for D Cox)

SOYBEAN DISEASES

Soybeans and other legume and grain crops are becoming an important part of the cane farming system, as they provide an essential break from a cane monoculture. However there has been an increase in the number of legume crops that are being grown back to back i.e. soybeans following soybeans. Doing this is not recommended because it increases the risk of pests and diseases building up in those crops – essentially we are creating a soybean or mungbean monoculture.

In late 2019 there were numerous reports of soybean crops suffering from leaf loss and premature death, particularly the variety A6785. DAF pathologists and entomologists visited the Burdekin and determined that there were 2 main causes. These were:

- Target spot
- Anthracnose

Soybean stem fly was found in a number of the crops, but wasn't considered to be the main problem.

	Target Spot *(Corynespora cassiicola)*	Anthracnose *(Colletotrichum spp.)*
Description	Reddish, brown lesions that start on the lower leaves but can be found on other leaves, stems and pods Defoliation may occur	Brown lesions on stems, petioles and pods that produce fungal fruiting bodies as they age Death of leaves and premature defoliation Affected pods produce fewer and smaller seeds
How is it spread?	Soil borne May be on crop debris Infected seed Wind and rain	Wind and rain Infected seed Crop debris
Ideal conditions	Extended periods of warm weather along with high humidity or rainfall	Warm, wet weather
Photos Lisa Kelly (DAF)		

Both of these pathogens can survive from one crop to another or between seasons if there is a disease source e.g. infected soil, crop residues or on seed. To minimise disease risks growers are encouraged to:

- Not use seed from affected crops to plant the next crop
- Avoid replanting soybeans into, or close to, affected blocks for at least 2 years
- Control weeds and volunteer soybeans that may be a disease host
- Rotate with non-host crops e.g. sugarcane
- Consider reduced plant populations or wider rows to encourage air flow and reduce humidity within the crop – this could have agronomic impacts so discuss with your agronomist first

Why A6785 was more affected than other varieties was not determined. Likely causes are that it is more susceptible to these diseases, or that it was at a period of high stress - i.e. late pod fill - and therefore less resilient to infection at the time when weather conditions favoured disease spread.

This information was drawn from a GRDC webinar. For more details or to watch the whole webinar go to:

https://grdc.com.au/events/past-events/2020/august/grdc-update-live-stream-peanuts-and-soybeans

STAFF CONTACTS

Contact	Title	Contact Number	Email
Office		(07) 4783 1101	reception@bps.net.au
Fax		(07) 4783 5327	
210 Old Clare Road, Ayr QLD, 4807 PO Box 237, Ayr QLD, 4807			
Rob Milla	Manager	0490 036 329	rmilla@bps.net.au
Mark Rickards	Commercial Manager	0427 834 800	mrickards@bps.net.au
Marian Davis	Extension Agronomist	0428 927 079	mdavis@bps.net.au
Cherrie Johnson	Trainee Extension Agronomist	0447 069 887	cjohnson@bps.net.au
Terry Granshaw	Extension Officer	0437 553 149	tgranshaw@bps.net.au
Jasmine Connolly	Extension Officer	0438 934 601	jconnolly@bps.net.au
Claire Bailey	Extension Officer	0437 134 043	cbailey@bps.net.au
David Paine	Field Officer – Kalamia	0427 167 159	dpaine@bps.net.au
Leigh Chapple	Field Officer – Invicta	0427 372 124	lchapple@bps.net.au
Wayne Johnstone	Field Officer – Inkerman	0407 960 057	wjohnstone@bps.net.au
Maddy Molino	Field Officer - Pioneer	0407 167 159	mmolino@bps.net.au