



CROP SCIENCE SOCIETY OF S.A. INCORPORATED

C/- WAITE CAMPUS

P.M.B No 1, GLEN OSMOND, SOUTH AUSTRALIA 5064

ABN: 68 746 893 290

NEWSLETTER No. 326 AUGUST, 2019

EDITOR – Judy Rathjen, articles welcome; Ph: 0421183978

email: juditrat@yahoo.com

SECRETARY – Peter Smith

peter@haddrickonfabric.com.au

Ph: 0411 127 478

NEXT MEETING

Thursday the 22nd of August at Roseworthy from 7.30pm.

Phil Cramond. Weed Science Society. Biological Control of Weeds - An update of past releases.

Ashley Pilkington - ADAMA - Cereal foliar disease responses to commercial active ingredients.

This meeting will be webcast to ensure wide access to members.

Zoom meeting details;

<https://zoom.us/j/31772295>

Notice regarding SA Government Press release 19/8/2019 regarding the moratorium on the cultivation of genetically modified crops in South Australia

The Crop Science Society of South Australia Incorporated (CSSSA) has advocated for the use of sound science to provide improvements in agricultural crop production for South Australian producers for decades. CSSSA is an active organisation of farmers, farming consultants and agricultural research scientists. The society has proven beneficial in providing a forum for the exchange of information between people in academic and applied fields; between research, teaching, extension workers, farmers and marketing representatives.

In recent years under the previous Labor government, policy has hampered progress of Agricultural science in this state, and the flow on effect has hindered the broader agricultural community. This had been ignored in favour of a populist view. In comparison, the veracity of Climate science is not questioned, in fact it has been lauded as providing explanation for many recent phenomena. More specifically, the benefits to the SA economy, environment & farmers from Genetically Modified (GM) technology have proven to be substantial. Not only through improved yields but through reduced farm chemical use and adoption of sustainable farming practices.

Our state's agricultural department (PIRSA) states on publicly available media that "The cultivation of GM (genetic modified) food crops is prohibited in South Australia, under the Genetically Modified Crops Management (Designation of Areas) Regulations 2008, which were made under the Genetically Modified Crops Management Act 2004. The delay in farmers & researchers having access to this important tool has placed the South Australian farmer nearly 2 decades behind our interstate counterparts through research capabilities and production improvements.

Further in reference to PIRSA literature "The South Australian Government's moratorium on the cultivation of GM food crops reflects ongoing concerns in the community about the potential impacts of GM food crops on the integrity of the state's conventional food production systems. In addition, the government believes GM food crops could have a negative impact on the marketing of the state's premium food and wine in export markets around the world.". Scientifically speaking this statement is hearsay with little or no validation, especially if compared to the premium wine regions of France where nuclear power co-exists with no brand damage.

A recent study conducted by Mercado has proven the apparent positive impacts of a non-GM production status in this state is unfounded. This supports a multitude of global studies that have been undertaken since the commercial release of GM crops over 30 years ago. Not only has the economic studies shown that there is no advantage to the state but commodities are trading at a penalty – a cumulative \$33 million penalty.

Currently consumers, feedlotters and processors can legally import (into SA) and manufacture from GM products. These products are widely available on supermarket shelves. Furthermore, after over 30 years of global, and Australian GM food and fibre production, the global science has proven GM technology is safe. In addition, GM crops have successfully co-existed with conventional farming systems and identity preserved crops.

Since the inception of the moratorium, and subsequent extension, the state has seen applications for sites to undertake GM research and studies dwindle. This has hampered the scientific

development of Agriculture in SA – once a state that lead Agricultural development. This had the potential to further lead to a reduction in trials and research conducted to determine the safety of newer GM technology – which may also disadvantage consumers and the public at large.

It must be noted that apart from a survey limited to a niche of primary producers, the evidence for the support of a GM moratorium extension within the agricultural community of SA has been limited to say the least.

The science of climate change has been strongly adopted by government and government agencies in Australia. Climate change presents a real risk to Australian farmers. The use of GM and emerging technologies for crop breeding to better manage these present and apparent risks is a must for the industry and society.

GM crops can assist in the creation of a sustainable future through improved crop production, environmental health and a reduction of pesticide applied in the environment. The acceptance of GM technology will also ensure farmers have all the available tools to produce food and fibre crops sustainably and competitively into the future.

Current Crop Science Society President, Craig Davis.

Member in focus – Ben Fleet

I am a past president and long standing committee member of the Crop Science Society. I am currently working as a research agronomist with the University of Adelaide based at Roseworthy Campus.

I have been working with Gurjeet Gill and Chris Preston at the University for more than 10 years on various GRDC funded projects into weed management. When time allows I am trying to finish off

my PhD studies into trifluralin resistance in annual ryegrass.

Before going back to the University I worked as an agronomic consultant with PIRSA Rural Solutions at Struan and with A.W. Vater & Co. at Saddleworth. Prior to this was a student researching ascochyta blight management in chickpeas for my honours and a B.Ag (dryland agriculture) degree at Roseworthy.



Currently our research group are working on various GRDC funded projects on cultural control of brome and annual ryegrass, management of locally important weeds, ecology and management of emerging weed species, status of barley grass resistance and ecology. At the moment I am spending a lot of time assessing and managing trials and trying to analyse and interpret data depending on the weather.

One thing that has really stood out this year with the cultural weed control project has been the impact of weed ecology, particularly how seedling dynamics can influence the effectiveness of our weed control strategies. One example of this is the very different outcomes of two identical brome grass management trials at Riverton and Mallala. Both trials have *Bromus diandrus*, Razor CL wheat, pre-emergent treatments, and adequate soil moisture from mid-May. At Riverton, delay in seeding wheat from 16 May to 31 May reduced brome grass density average across all treatments from 385 to 77 brome grass plants m². This equates to an 80% reduction in brome grass with the use of an effective knockdown herbicide when seeding was delayed. In contrast, there was no reduction (1%) in brome at Mallala by delaying seeding, with the site average of 356 (16 May) and 352 (31 May) plants m².

The difference in these contrasting trials is the weed ecology, in particular the seedling dynamics of the weed population. The Riverton brome population germinates quickly in a flush once the season breaks and so strategies like delayed seeding work well and could be considered. The Mallala population has greater seed dormancy, resulting in prolonged and staggered germination. In this case, delayed seeding would not be advisable and early seeding with an aim of maximising early crop competition is likely to be more effective. The seeding time can also influence the effectiveness of different pre-emergent herbicide options, depending on their residual properties. Similar results occurred in annual ryegrass in 2018, where at Minnipa ryegrass plant density was nearly halved when seeding was delayed, whereas at Roseworthy where the weed population had greater seed dormancy, it made no difference. In addition to understanding herbicide resistance in our weed populations, it is also important that we consider their germination behaviour to further improve weed management.

Crop science is a great way to feed my interest across a wider breadth of topics, given that I am working in a specialty field. It is also great for building and maintaining networks and has allowed me to spend time with and learn from great mentors like John Both and Chris Butler.



We parked the little Kingaroy next to the Farm's case as working in same paddock, the Kingaroy has less capacity and looks small, but spent a lot less time pulled up with a mechanic scratching their head trying to get working than the that 8010!

Herbicide resistance in *Sonchus oleraceus* (common sowthistle) and its management in *Lens culinaris* (lentil)

Daniel Petersen, Jenna Malone and Gurjeet Gill
School of Agriculture, Food and Wine, The University of Adelaide

Introduction

S. oleraceus management in Australia is largely dependent on three different herbicide modes of action, which include: (a) acetolactate synthase (ALS) inhibitors; (b) 5-enolpyruvylshikimate-3-phosphate synthase (EPSPS) inhibitors; and (c) synthetic auxins. A significant proportion of *L. culinaris* cultivars grown in the southern region of Australia are tolerant of ALS-inhibitor herbicides (Davidson et al., 2016). Despite increasing concerns over *S. oleraceus* control failures in areas of intensive *L. culinaris* production, there is limited information available on the presence of herbicide resistance in this species. Resistance to ALS-inhibitor herbicides is known to evolve rapidly and has been confirmed in *S. oleraceus* (Boutsalis and Powles, 1995b). There have also been two reported cases of synthetic auxin resistance in *S. oleraceus* in southern Australia, while EPSPS-inhibitor resistance in this species is exclusive to northern Australia (Cook et al., 2014; Heap, 2014).

As *S. oleraceus* is a prolific seed producer, management tactics that reduce its seed output are likely to be helpful in its management. Crop-topping is a management strategy that reduces viable seed production in annual weed species through non-selective herbicide applications at physiological crop maturity (Walsh and Powles, 2014). Application of non-selective herbicides is commonly practiced in SA because they have been shown to alleviate the post-maturation losses associated with the spatial variation in physiological maturity originating from the indeterminate growth habit in *L. culinaris* (Zhang et al., 2015). Information is needed on the sensitivity of *S. oleraceus* achenes at different stages of development to various non-selective herbicides. In *Lolium rigidum* (rigid ryegrass), optimum timing of crop-topping can reduce viable seed production by up to 80% (Steadman et al., 2006).

The aims of the study presented here were to: (1) determine the presence and level of resistance to ALS- and EPSPS-inhibitor, and synthetic auxin herbicides in *S. oleraceus* populations from the YP and LMN regions; (2) identify if resistance in *S. oleraceus* is associated with known mutations in the ALS and EPSPS genes; and (3) quantify the reduction in achene production by *S. oleraceus* following the application of different non-selective herbicides at anthesis, and known post-anthesis stages of development.

Methods

Herbicide Resistance Survey. A targeted herbicide resistance survey for *S. oleraceus* was conducted in *L. culinaris* fields across the YP and LMN regions of SA (Figure 1). There were thirteen sites sampled prior to harvest on the YP on November 12, 2017. An additional four populations were collected post-harvest from the LMN on March 6, 2018. At each site, a 0.25 m² quadrant was randomly placed by two people at ten different positions along a perpendicular transect of approximately 300 m in length to obtain a total of 20 samples. All of the capitula were harvested from plants within the quadrant and bulked.

Populations of *S. oleraceus* were screened for resistance to ALS- and EPSPS-inhibitor, and synthetic auxin herbicides at the recommended field rates. Dose-response studies were conducted in Experiment 2 (July, 2018) using metsulfuron and imazamox + imazapyr to further investigate the level of resistance in selected populations. Herbicide treatment rates were: 0, 4.5, 9, 18, 36, 72 and 144 g ha⁻¹ of imazamox + imazapyr, and 0, 0.38, 0.75, 1.5, 3, 6 and 12 g ha⁻¹ metsulfuron. Population ST18 was known to be susceptible to the different herbicides and was used as a replicated positive control to validate resistance in Experiment 1 and 2. Survival assessments were made 28 days after the herbicide treatments were applied. Plants with new growth at the shoot apical meristems were classified as resistant.

Achene Sterilisation by Crop-Topping: There were five *S. oleraceus* seedlings transplanted into 8.5 L pots containing coco peat in a replicated (n=5) whole-plant bioassay. Pilot studies showed that achene dehiscence occurred 12 days after anthesis; during this time 145 degree-days were

accumulated. Herbicide treatments included: 987 g ha⁻¹ of glyphosate, 200 g ha⁻¹ of paraquat and 987 g ha⁻¹ of glyphosate + 23.8 g ha⁻¹ of saflufenacil.

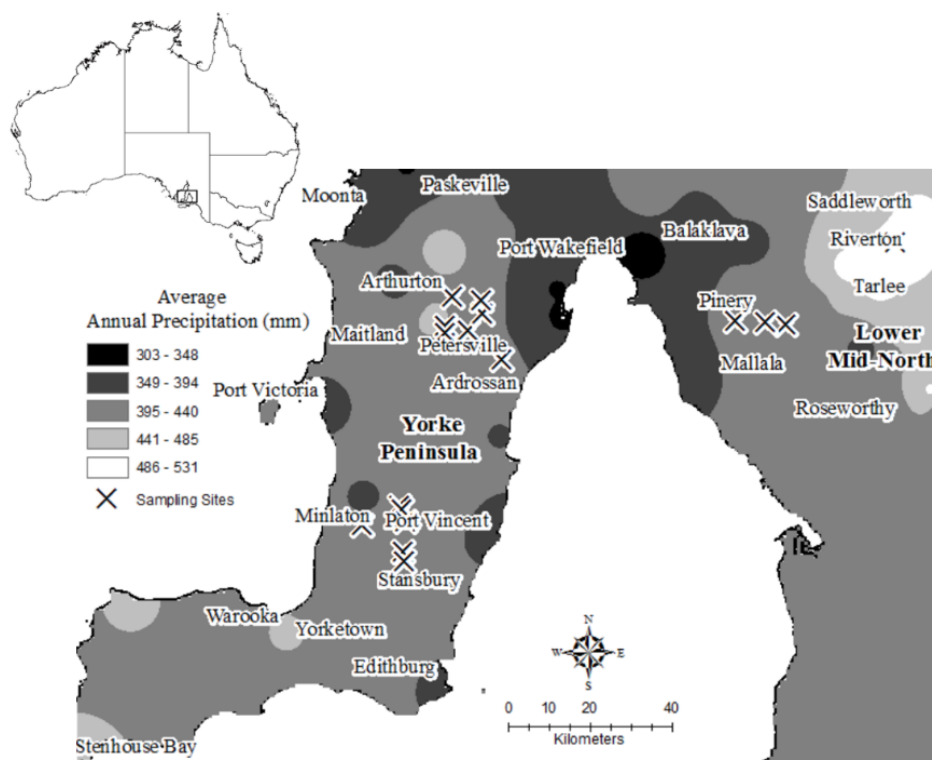


Figure 1. The georeferenced locations of seventeen *L. culinaris* fields that were sampled for *S. oleraceus* in the YP and LMN regions of SA. Each marked sampling site constitutes a different *S. oleraceus* population. The long-term annual average precipitation ranged from 395 to 531 mm across the sampling sites.

Results and Discussion

Screening and Dose-Response Studies. A high incidence of resistance to ALS-inhibitor herbicides was ascertained from the targeted herbicide resistance survey (Table 3). Classifications of resistance were made if there was a significant difference between the mean mortality of the field population and the known susceptible population 28 days after the herbicide treatment. Resistance to the sulfonylurea herbicide metsulfuron was detected in 86% of the populations screened (Table 3). Imidazolinone resistance was less common, as 36% of populations were susceptible to the herbicide imazamox + imazapyr. Cross-resistance to both ALS-inhibitor herbicides was identified in 64% of the populations. All populations were susceptible to the herbicides 2, 4-D and glyphosate.

Table 3. The mean mortality of *S. oleraceus* populations from the YP and LMN regions 28 days after treatment with: the synthetic auxin 2, 4-D; the EPSPS- inhibitor glyphosate; and the ALS-inhibitors metsulfuron, and imazamox + imazapyr.

Population	Mean Mortality (%)			
	2,4-D 455 g ha ⁻¹	Glyphosate 470 g ha ⁻¹	Metsulfuron 3 g ha ⁻¹	Imazamox + Imazapyr 24.75 g ha ⁻¹ + 11.25 g ha ⁻¹
ST1	100	100	73bc†	93 ^{cd}
ST2	100	100	0 ^a	26abc
ST3	100	100	28 ^{ab}	45abcd
ST4	100	100	0 ^a	13 ^{ab}
ST6	100	100	89 ^c	23 ^{ab}
ST7	100	100	11 ^a	69bcd
ST9	100	100	0 ^a	0 ^a
ST10	100	100	0 ^a	6 ^{ab}
ST11	100	100	0 ^a	0 ^a
ST12	100	100	0 ^a	65bcd
ST13	100	100	0 ^a	51bcd
ST14	100	100	0 ^a	0 ^a
ST15	100	100	33 ^{ab}	22 ^{ab}
ST16	100	100	30 ^{ab}	5 ^{ab}
ST18*	100	100	100 ^c	100 ^d
LSD (P≤0.05)	NS	NS	13	21

†Different letters indicate a significant difference between populations (P≤ 0.05).

*Population ST18 is known to be susceptible to the four herbicides.

There were variations in the level of metsulfuron resistance observed between *S. oleraceus* populations (Table 4). The susceptible population (ST18) was completely controlled at the lowest rate of 375 mg ha⁻¹, which is 13% of the field rate (Table 4, Figure 2). This suggests that the nine populations expressed a much higher level of resistance to metsulfuron than the susceptible control (Table 4). Population ST9 was most resistant to metsulfuron, with mean survival of 92% (Figure 2) at the recommended field rate (3, 000 mg ha⁻¹), and 51% survival at four times the field rate (12, 000 mg ha⁻¹). The estimated LD50 of 12, 373 mg ha⁻¹ for population ST9 was more than four times the recommended field rate (Figure 2). The overlap of the 95% confidence intervals (Table 4) highlights that there were no significant differences observed between populations until the LD50 exceeded 4,064 mg ha⁻¹. The width of the confidence intervals for some populations reflect variations in the frequency of resistance and susceptible alleles that occur in the field.

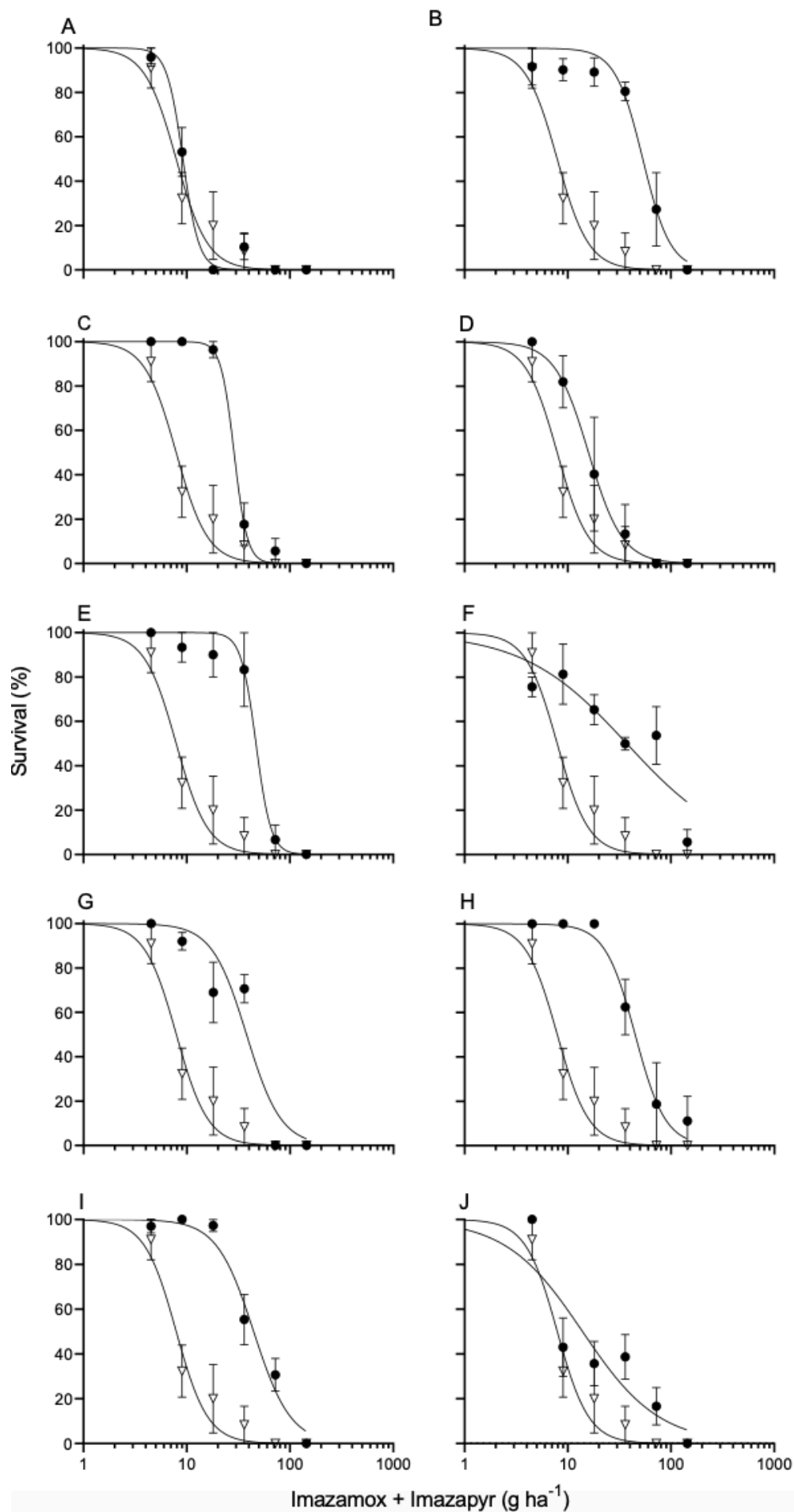


Figure 3. Response of ten *S. oleraceus* populations from the YP (\bullet) to treatment with varying rates of imazamox + imazapyr. These populations were: (A) ST1; (B) ST2; (C) ST4; (D) ST 5; (E) ST6; (F) ST7; (G) ST8; (H) ST9; (I) ST11; (J) ST12; and a known susceptible population ST18 (∇). The recommended field rate of imazamox was 36 g ha^{-1}

Table 4. The estimated dose of metsulfuron required to induce 50% plant mortality (LD₅₀) in nine *S. oleraceus* populations from the YP and LMN regions.

Population	Metsulfuron
	LD ₅₀ (mg ha ⁻¹) ^a
ST1	4,064 (2,444, 6,782) ^b
ST2	2,231 (1,744, 3,366)
ST4	2,344 (1,983, 2,764)
ST5	4,159 (3,609, 4,765)
ST7	2,418 (1,744, 3,366)
ST8	4,520 (3,740, 5,481)
ST9	12,373 (10,267, 18,129)
ST12	3,614 (2,512, 5,244)
ST14	4,364 (3,230, 5,880)
ST18 ^c	-

a The recommended field rate for the control of *S. oleraceus* was 3,000 mg ha⁻¹.

b Values in parentheses are 95% confidence intervals.

c Population ST18 is known to be susceptible to metsulfuron; complete mortality was observed at the lowest rate.

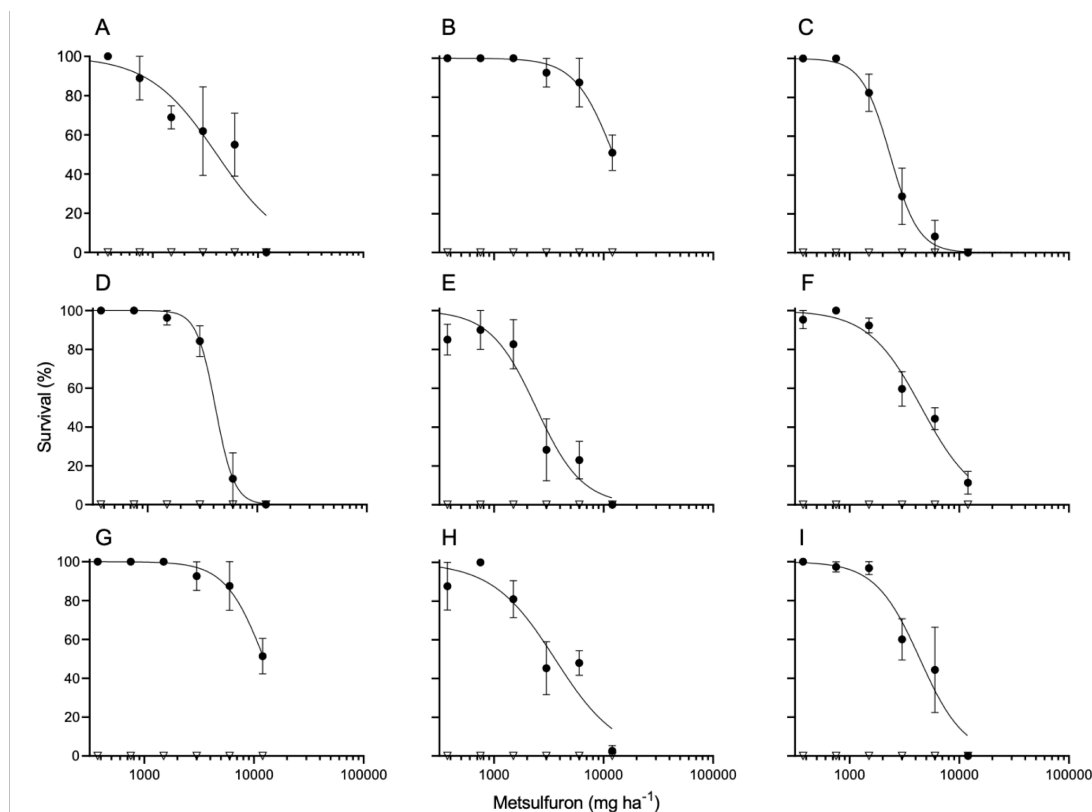


Figure 2. Dose-response curves for nine *S. oleraceus* populations from the YP and LMN (●), which included: (A) ST1; (B) ST2; (C) ST4; (D) ST5; (E) ST7; (F) ST8; (G) ST9; (H) ST12; (I) ST14; and a known susceptible population ST18 (▽) following treatment with metsulfuron. Survival was assessed 28 days after spraying. The recommended field rate was 3,000 mg ha⁻¹.

There were some differences in the level of cross-resistance to the sulfonylurea and imidazolinone herbicides among the same eight populations, but the expression of sulfonylurea resistance was generally much stronger (Table 4 and 5). Population ST6 was susceptible to metsulfuron, but had an intermediate level of imidazolinone resistance (Figure 3). There was up to a seven-fold increase in imidazolinone resistance between six populations (ST2, ST6, ST7, ST8, ST9 and ST11) and the susceptible control (Table 5).

Table 5. The estimated dose of imazamox + imazapyr required to induce 50% plant mortality (LD₅₀) in ten *S. oleraceus* populations from YP.

Population	Imazamox + Imazapyr ^a	Resistance Index ^d
	LD ₅₀ (g ha ⁻¹)	
ST1	9.18 (8.35, 10.13) ^b	1.16
ST2	53.36 (43.21, 65.05)	6.75
ST4	28.76 (25.47, 32.05)	3.64
ST5	15.90 (11.81, 21.56)	2.01
ST6	37.81 (27.47, 49.81)	4.78
ST7	37.38 (22.20, 64.81)	4.73
ST8	46.88 (41.16, 55.53)	5.93
ST9	50.70 (32.06, 84.40)	6.41
ST11	44.43(37.49, 52.86)	5.62
ST12	13.88 (8.57, 22.24)	1.76
ST18 ^c	7.91(6.28, 10.39)	-

a The recommended field rate for the control of *S. oleraceus* was 36 g ha⁻¹.

b Values in parentheses are 95% confidence intervals.

c Population ST18 is known to be susceptible to imazamox + imazapyr.

d Resistance index is the LD₅₀ ratio of resistant/susceptible.

This study has confirmed that *S. oleraceus* has evolved resistance to sulfonylurea and imidazolinone herbicides in the YP and LMN regions, which is contributing to dense infestations in *L. culinaris*. More weed species have evolved resistance to ALS-inhibitor herbicides than alternative modes of action in Australia because of their widespread use and selection pressure exerted on sensitive biotypes (Heap, 2018; Yu and Powles, 2014).

The number of viable achenes capitula⁻¹ was generally low, even in the absence of the herbicide treatments (Figure 5b). The level of achene sterilization was dependent on the timing of the herbicide application, but not the herbicide treatment ($P=0.193$). Post-hoc Tukey's test revealed that herbicide treatments were least effective when applied ten days after anthesis, compared to the two earlier timings (Figure 5b). While more filled achenes were produced when herbicide treatments were applied ten days after anthesis, the number of viable achenes capitula⁻¹ was relatively low (<20%).

Non-selective herbicides provide an opportunity to manage *S. oleraceus* seedbank replenishment. The results from this experiment demonstrated that both the herbicide treatment and timing of application influenced achene development. The percentage of filled achenes at the varying application intervals reflects the onset of phytotoxicity from the different herbicide modes of action. Embryo development was not repressed or aborted following glyphosate treatment ten days after anthesis. These findings are consistent with a study by Shuma and Raju (1993) of

Avena. fatua (wild oat), which found few embryo abnormalities when glyphosate was applied nine days after anthesis. In contrast, application of glyphosate to immature achenes prevented complete development because dividing tissue was deprived of aromatic amino acids, while phytotoxic levels of shikimic acid may have also accumulated (Sammons and Gaines, 2014). In contrast, paraquat and saflufenacil elicit light-dependent photo-oxidative stress (Grossmann et al., 2010; Harris and Dodge, 1972). Saflufenacil is translocated through the xylem and is less likely to accumulate in reproductive tissue and sterilize mature achenes (Liebl et al., 2008). Paraquat achieved similar levels of achene sterilization when applied at anthesis, and ten days after anthesis. This also supports the work of Steadman et al. (2006), which showed that filled *L. rigidum* seeds treated with paraquat were mostly unviable. Even though achene viability was reduced by herbicide treatments applied ten days after anthesis (<20%), *S. oleraceus* plants are still likely to produce a large amount of viable achenes (~2,500 achenes m⁻²).

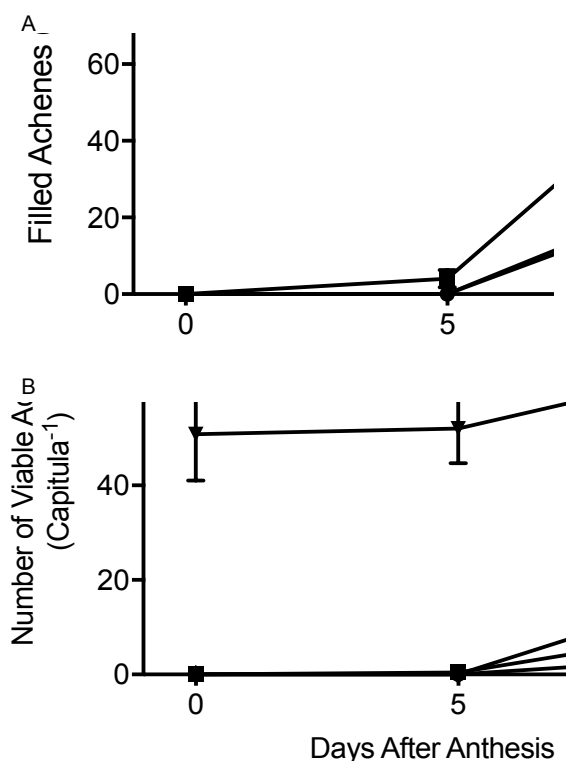


Figure 5. (A) The percentage of *S. oleraceus* achenes that were filled. (B) The estimated number of viable *S. oleraceus* achenes in tagged capitula. Herbicide treatments included: paraquat (●), glyphosate (■), and glyphosate + saflufenacil (◆), in addition to an untreated control (▼). Herbicides treatments were applied at the recommended field rate at three timings: anthesis, five days after anthesis, and ten days after anthesis.

Herbicide resistance surveys provide a valuable tool for growers, advisors and researchers to monitor weed control failures. Widespread resistance to ALS-inhibitor herbicides in the YP and Figure 5. (A) The percentage of *S. oleraceus* achenes that were filled. (B) The estimated number of viable *S. oleraceus* achenes in tagged capitula. Herbicide treatments included: paraquat (●), glyphosate (■), and glyphosate + saflufenacil (◆), in addition to an untreated control (▼). Herbicides treatments were applied at the recommended field rate at three timings: anthesis, five days after anthesis, and ten days after anthesis.

LMN regions, and cross-resistance to different classes of this mode of action shows that growers have exhausted all of the post-emergent herbicide control options to manage *S. oleraceus* in *L. culinaris*. Investigation of the mechanism for ALS-inhibitor resistance has revealed the presence of the first documented cases of a field evolved target-site mutation in the ALS gene of *S. oleraceus*. Understanding the mechanism for ALS-inhibitor resistance will contribute to better management of *S. oleraceus* by ascertaining patterns of cross-resistance. Although, further research is

necessary to identify the resistance encoded by SNPs at the Pro197 residue to the triazolopyrimidine sulfonanilide, pyrimidinyl-thiobenzoate and sulfonyl-amino-carbonyl-triazolinones classes of ALS-inhibitors. Studies are also required to establish presence of non-target site resistance in *S. oleraceus* populations from the YP and LMN regions, as P450 monooxygenase mediated metabolism has been associated with non-target-site resistance to ALS-inhibitor herbicides in other weed species (Yu et al. 2009; Owen et al., 2016). This study has also shown that very high proportions (>80%) of almost mature achenes were sterilized by non-selective herbicide applications. Therefore, growers need to closely monitor their *L. culinaris* crops and apply non-selective herbicides at a time when *S. oleraceus* is sensitive to the treatment. Additional studies are needed to determine the yield implications of crop-topping *L. culinaris* to achieve complete sterilization of *S. oleraceus* achenes. Developing effective management strategies for *S. oleraceus* will help to maintain sustainable *L. culinaris* production systems.

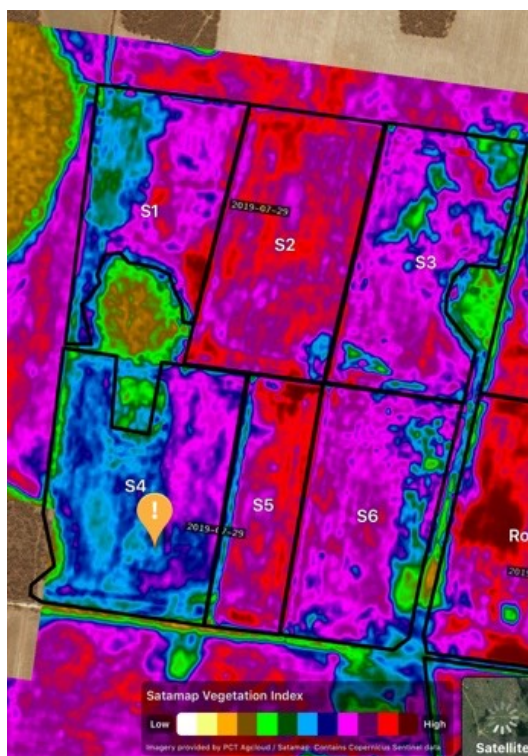
Images from Craig Davis in his travels....



Rhizoctonia symptoms: Scepter wheat sown into Jumbo 2 lentil stubble



Potassium deficiency in wheat. Scepter Wheat sown into vetch pasture. Tissue test shows N,P, S, traces all ok, but K severely deficient. A good trial site.



NDVI data from satellite imagery assists in decision making. The use of Normalised Differential Vegetation Index (NDVI) to assist crop inspections, planning and adjusting applications. All at a touch of the finger (and some download time...).



It's that time of year for commercial trial walks. Here at Roseworthy, BASF are showcasing some exciting new chemistry coming to market soon.

BETTER WEATHER DATA FOR SPRAYING

PRIMARY
INDUSTRIES
& REGIONS SA
PIRSA



Regional
Connections



AGRILINK
Agricultural Consultants



40 brand new weather stations across the Mid-North, all freely accessible to the public

Temperature inversion,
grass fire danger index (GFDI)
and lots more live data available
from every station

This network of 40 automatic weather stations spreads across the region, from Jamestown and Port Pirie in the north, in and around the Clare Valley and almost to Two Wells in the south.

It provides a weather monitoring and warning system sufficient to provide highly accurate and targeted data on the development and presence of adverse conditions for spraying.

We'll give you access & help you interpret the data with 13 free workshops across the Mid-North

	Aug 28	Aug 29	Aug 30	Sept 2	Sept 3	Sept 5	Sept 6
8:00 am – 10:00 am		Hart Hart Shed	Balaklava via Halbury / Whitwarta Ag Bureau	Crystal Brook Footy Club	Hilltown Hilltown Hall	Clare The Valley's Lifestyle Centre	Mallala via Mallala Ag Bureau
11:00 am – 1:00 pm		Spalding Spalding Hall		Georgetown Georgetown Hall	Farrell Flat Gally's Meeting House		
2:30 pm – 4:30 pm	Lochiel Footy Club	Booborowie Booborowie Hall		Jamestown Sir Hubert Wilkins Visitor Centre	Marrabel Marrabel Hall		

Mid North Mesonet

Crop Science Society of SA AGM

Meeting held at Richardson Theatre Roseworthy, University of Adelaide

Date July 17 2019

Meeting opened: 7:40pm.

Attendance: C Davis, A Lehmann, P Grocke, B Munzberg, D Petersen, I Jenkin, J Lush, P Smith, A Behn, G Davies, M Hill, A Pfitzner, J Wilson, B fleet, R Wheeler, C Butler, P Cousins, A Bowyer, J Reichstein, N Wittwer, R Schilling, M Nash, R Konzag, G Schuster, P Lush, D Ray, C Rhodes, Leighton, N Lush, (Zoom) – D Sommerville, Stuart, Rick, P Royal, D Stephenson, A Robinson.

Apologies: P Boutsalis, T Robison, K Porker, C Robinson, D Shepherd.

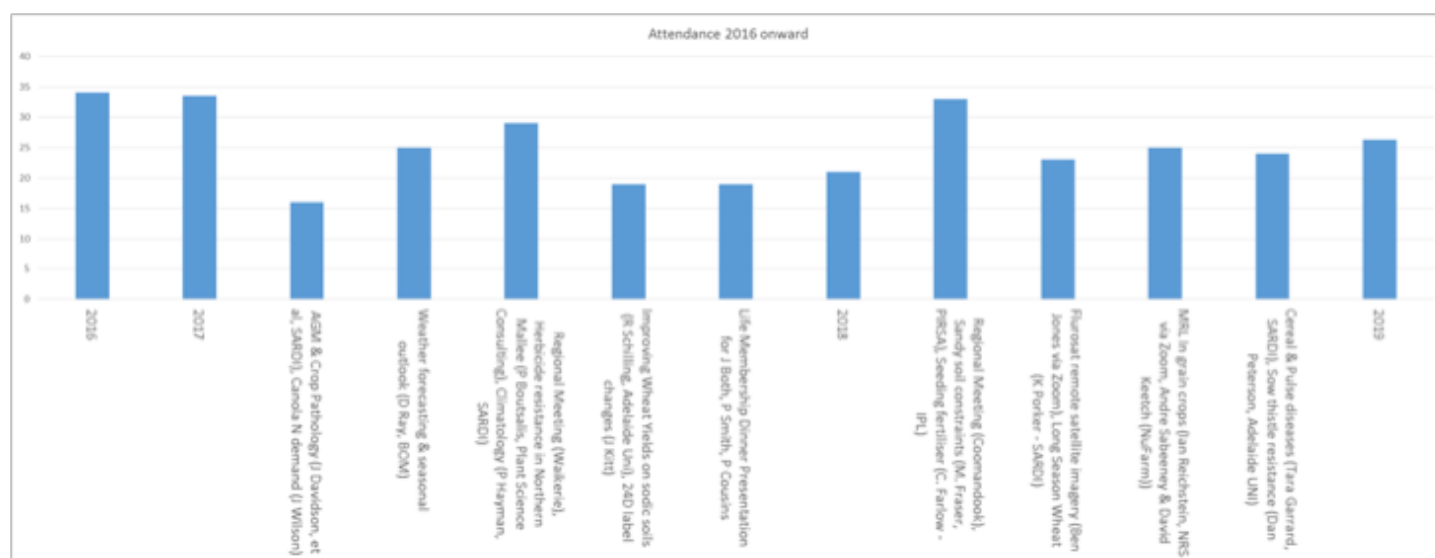
Minutes of previous AGM

Moved: A Pfitzner Seconded: M Hill Accepted

Business Arising from Previous Minutes

Presidents Report)

The Crop Science Society has had a consistent year with some successful Regional meetings. We have introduced Zoom webcasts, which currently appear to be catching the shortfall of physical members present at meetings, rather than increasing attendance.



We understand that the Website needs further & regular updating to be relevant, but that process has been initiated and will be ongoing.

Thanks to Judy for continual work on the newsletter, and for promoting improvements in the content of the material.

The feasibility of a dedicated Administration/Communications function to assist in Society engagement with current & potential members has been a slow slog for the last 12 months – but aims to increase member engagement.

Thanks must go to Susan Fuss & Nicky Hannaford for their efforts over the years as Treasurer. We now look to merge the finance role into the expanded administration & communications role.

Thanks also to the committee who have contributed additional time & work with the regional meetings & other contributions.

Current membership has been updated to now reflect an actual database count of 313, down from 365.

Moved: (president) C Davis Seconded: J Wilson Accepted

Secretaries Report

- GMO moratorium review. Letter sent to J Darley and Craig, Jamie Wilson and Peter Cousins presented to the committee in July
Comment received from the committee was of the high quality of the CSSSSA letter and presentation
- Letter to chair of planning commission. Further information has been provided and M Faulkner was nominated as representative on the board. No letter of confirmation has been received.

Correspondence

Moved: (secretary) P Smith Seconded: Peter Grocke Accepted

Treasurers Report

Little change in income for this year compared to previous, however it is down slightly from 48 members coming off the books.
Scholarships valued at approx \$5000 have been awarded.

Moved (treasurer) N. Wittwer Seconded C Butler Accepted

Membership Cost

- The committee recommends the cost remains at \$33.00 (\$30 +GST)
- Moved N Wittwer Seconded A Pfitzner Accepted

CSSSA Life memberships

Hugh Wallwork for significant and regular contribution to the society

Moved M Hill seconded R Konzag Accepted

Crop Science Committee

CROP SCIENCE SOCIETY OF SA
TREASURERS REPORT END JUNE 2019

SUMMARY

- CSSA is showing a LOSS for the year of **\$1228.04**
- as per profit and loss statement
- **ANZ CASH MANAGEMENT ACCOUNT BALANCE END JUNE 2017 IS \$8268.72**
- **ANZ TERM DEPOSIT BALANCE AT END JUNE 2017 IS \$88375.02**
- Subscription income received as below
 - 16/17 \$99
 - 17/18 \$462
 - 17/18 \$7260

There are currently 314 members on the data base

- Free one-year subs -1 taken up Uni Diploma of Ag Students
- 8 New paid members.
- 43 members have been removed from the database. The majority of those had not paid subs for the previous 2 years. A few were removed at their request, for varying reasons.

PROFIT & LOSS YEAR END JUNE 2019

GST Inclusive
Months : Jul 2018 to Jun 2019
Cashflow accounts only : ANZ Cash Management A/c, ANZ Term Deposit
Enterprises : CROP SCIENCE

Income			
1	SUBSCRIPTIONS	7,821.00	
2	BUS TOUR	33.00	
4	INTEREST RECEIVED	1,412.52	
7	SUNDRY INCOME	33.00	
	Total receipts	<u>9,299.52</u>	<u>9,299.52</u>
Expense			
13	AGM	448.50	
14	MEETING COSTS	1,409.96	
15	POSTAGE	423.00	
17	INVOICE EXPENSES	249.00	
21	BANK FEES	116.60	
23	SUNDRY EXPENSES	80.00	
24	INSURANCE	755.00	
30	TREASURER'S WORK	1,369.50	
32	SPONSORSHIPS	5,676.00	
	Total payments	<u>10,527.56</u>	<u>10,527.56</u>
	Commodity Gross Profit		
	Livestock Gross Profit		
	Total Revenue	9,299.52	
	Total Expense	10,527.56	
	Total Profit (Loss)	(1,228.04)	(1,228.04)
*** End of Report ***			

President thanked all members for their contribution to the CSSA. There are no resignations and all executive positions are unchanged as they continue their 2 year term.

All current members are willing to stand and Zac Zweck has agreed to be nominated.
It was moved that all members nominated be approved as committee

Moved C Butler Seconded P Grocke Accepted

Positions for 2019/2020

- President: Craig Davis
- Vice President: Kenton Porker
- Secretary: Peter Smith
- Treasurer: Neil Wittwer
- Public Officer: Peter Smith

- Committee Members

- Judy Rathjen
- Tom Robinson
- Anthony Pfitzner
- Ben Fleet
- Jamie Wilson
- Ben Munzberg
- Dan Petersen
- Zac Zweck

Crop Science Society of SA Signatories

- Craig Davis (President)
- Susan Fuss (Book keeper)
- Anthony Pfitzner (Committee Member)

Audit

Has been done by Di McNerney (CPA) in the past at no cost.

Motion Committee to appoint an Auditor

Moved P Cousins Seconded C Butler Accepted.

General Business

- Administration Position

Application process has been tendered out and 3 applicants replied. The subcommittee deemed that application by Ag Communicators be accepted (indicating that other applicants lacked the level of experience or expertise).

Quote for 100 hours work is \$13000 + GST (i.e. ie \$130/hr.) to administer the major roles of CSSSA. Although considered to be a higher figure than other applicants it was clear that the level of work consolidating current databases, establishing relevant newsletter, meeting and media connections required, warranted the appointment of Ag Communicators.

It was proposed that the society trial this arrangement for 12 months this administration process and, using indicators and response from executive committee, as well as a member, survey members in mid year 2020, determine about the feasibility of continuing with Ag Communicators.

Assuming an improvement in member feedback through the survey response there is potential to increase membership cost to \$60 to cover administration costs.

Indicators of value for money.

- Efficiency improvements for the operation of committee and society. To be reported by executive.
- Maintain and improve membership.
- Improved media opportunities of CSSSA to Ag Community.

- Maintenance of newsletter distribution and archiving.
- Improved visibility of the Society through the website and social media.

Motion: That Ag Communicators be appointed to undertake the administration role. To gauge the efficiency and value of this appointment at the end of 12 months.

Moved: A Pfitzner seconded P Grocke Accepted

•New Honorary Award

In recognition of the late John Both it was proposed that an award be set up in his name.

The award is for "Significant contribution to crop protection through field research".

.Nominations will be called for in March each year and announced at the AGM

The award will consist of

- A certificate to be presented at a formal event along with an emblazoned item of clothing.
- Media coverage of the winner.

Moved N Wittwer Seconded P Grocke Accepted

•Duncan Correll Travel Award

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2 nominations have been approved \$1000 each

- Kara Levin is a third year PhD student at the University of Adelaide studying plant breeding and genetics. Her PhD work is on the resistance of wheat against to cereal cyst nematodes (CCN). The scholarship will assist her attend Plant Biology 2019, which is the annual conference of the international American Society of Plant Biologists. She has have been selected to give a talk at Plant Biology 2019 on her abstract titled "Structural modification of the central metaxylem in nematode-infected roots: parasitic strategy or plant defence?" The conference is held in San Jose, CA from August 3-7th, 2019.

- Jade Rose is currently the Hart Field-Site Group regional intern. Previous to this position she completed her honours with SARDI and The University of Adelaide in 2018 where she was researching ascochyta blight in lentils. At Hart she is working on field trials looking at reducing blackspot in field pea, using canopy management and fungicides. The scholarship will assist her attend the Australasian Plant Pathology (APPS) conference (25th-28th November) in Melbourne. She has submitted an abstract for the conference to present a poster (or oral presentation) based on her honours project.

•Meeting time and attendance

The meeting confirmed the committees plan to continue with current meeting format.

○Tony Rathjen Newsletter prize

○No nomination

Meeting Closed

8.20 pm