# 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

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**Tara Garrard – SARDI**: Cereal disease risks for 2019.

**Dan Peterson – University of Adelaide PhD**: Understanding herbicide resistance in Sow thistle.

**<u>This meeting is to be held at Roseworthy, 7.30pm</u>**

## Also broadcast via Zoom!

# John Both

John Edward Both was a residential student of the Roseworthy Ag College from 1969, completing his course in 1972 and graduating in 1973 with his Roseworthy Diploma in Agriculture Technology (RDAT). Coming in the top 20% of his year. He is one of the last graduates to be recognised on the Roseworthy Ag Colleges Honour board in the Campus dining room. John also went on to complete an MBA with University of Adelaide some years later.

John joined the SA Department of Agriculture in 1973 as an Editor of the "Journal of Agriculture". He continued in this role for 2 years. John then worked as a district agronomist at the Kadina office of the SA Department of Agriculture and he was recognised for his practical and simple approach, remaining in this role until 1986. At Kadina John worked alongside other well known contributors such as Trevor Dillon (Dec.).

John then spent some time working for TAFE running on-farm training programs, progressing to write a version of the Chemical User/Handlers accreditation program, was an Agsafe Coordinator and continued to facilitate, deliver and assess the On-Farm Trainees course for some years. John travelled to WA, QLD, NSW and around SA to run these courses.

After these stints in public service, John joined the Australian owned Agricultural Chemical Manufacturer NuFarm Limited in 1990. He was initially employed as a Territory Manager for the Yorke Peninsula and Mid North, based in Kadina. He absolutely excelled at this role and really set the frame work for modern Ag Chem technical expertise in this farming region.

John went on to train a whole generation of private consultants who had left the Dept of Ag. He was a preferred resource for information on a wide range of control techniques from weed control, fungicides and insecticides, particularly pre-emergent herbicides, but also innovative post-emergents.

He formed very strong bonds with growers, private consultants, resellers and researchers that endured for life.

John moved to Adelaide some years later to take on the role of SA State Product Development Manager and later as State Manager for NuFarm. He continued to be a very much respected member of the NuFarm team and was highly valued.

In 2000 John moved into Research and Development as NuFarm's SA based Research and Development Officer. He spent the last 17 years with NuFarm there, and was much suited to the role with his technical background in agronomy.

John was an active participant of the Crop Science Society of SA. He was a long term financial member, committee member & President of the Society from 2010-2012. The society regularly invited John to present on a wide range of topics, and he was always a willing contributor. John was always prepared to offer his opinion on a wide range of topics, and was always genuine in his dealings with others.

John was influencial across the industry around many key issues such as chemical spray drift, Ag Chem labelling & buffer zones. Furthermore, he pushed himself outside of his normal comfort zone to promote important industry issues to the Government, but was never politically motivated in his dealings.  As the President & as a member of the Crop Science Society he was able to inform key parliamentarians on many issues that the state's Ag industry felt was not being heard.  He was asked to give evidence to Governmental hearings, and provided a voice on many key issues around spray drift management, buffer zones, GMO crops & planning.

Fortunately, the Crop Science Society were able to recognize John's efforts and award him a Life Membership in 2018.  Unfortunately, he didn't have much time to enjoy it.

John Both was a significant contributor to many Agriculturalists lives.  He gave his time to hone his craft & even more time to share it with others.

Farm upskilling, research & development, industry advocating & being a helpful, enjoyable bloke made up John's work life.  Always a smile and a catch up chat, and one of the most knowledgeable guys in the SA Agriculture industry.

John was recognised with a large gathering at his funeral held at Gawler on the 28th May 2019, and is survived by his wife Cheryl.

*Written by Craig Davis, with Rusell Mead, Allan Mayfield and David Brown*

The Crop Science Society of SA
P.M.B. No.1
GLEN OSMOND SA 5064, AUSTRALIA

# The Crop Science Society of SA

## is combining with the Upper North Farming Systems & Surrounding Ag Bureau's

***for a regional meeting***

**Wednesday, July the 17th, 7.30pm at Spalding Hall.**

**The Crop Science Society has a history in delivering quality speakers into regional settings to deliver science where it matters.**

**Save the date, and keep your eyes out for further details**.

Light supper will be available at the venue after the meeting.

For more details, or membership information, contact cropsssa@gmail.com or 0447 541 654.

**Visitors are always welcome!**

## A holistic approach to seep management for preventing land degradation in the landscape - *National Landcare Program Smart Farming Partnership*

Rhiannon Schilling, University of Adelaide

- Saline seeps occur, typically in low lying land, where perched saline groundwater reaches the soil surface. Seeps cause soils to become waterlogged and highly saline reducing crop growth. This can have significant long-term impacts on farm productivity. Current modelling indicates that seeps could seriously affect approximately 22,500 ha of Mallee farmland within ten years.
- An increase in the occurrence of saline seeps has already occurred in recent years (Figure 1). This is thought to be an unintended outcome of farmers following current best management practices to converse soil moisture. Specifically, farmers have been encouraged to use chemical fallow rather than cultivation to prevent summer weeds. A combination of low plant water use over summer and high intensity summer rainfall is increasing rates of deep-water drainage through the soil profile. This is contributing to recharge of local groundwater systems which drives seep formation.
- A new 5-year National Landcare Smart Farming Partnership project led by Mallee Sustainable Farming (MSF) with collaborators from the South Australian Murray Darling Basin Natural Resources Management Board, Mallee Catchment Management Authority, CSIRO, University of Adelaide, Insight Extension for Agriculture, AGRIvision, Coorong Tatiara Local Action Planning Association and Moodie Agronomy will be focused on seep management and remediation options for farmers.
- This project has the following aims:

1. Building a better understanding of saline seeps, including novel ways to identify areas at risk and the conditions that drive that risk
2. Preventing seep formation by providing farmers with support to identify areas at risk and identify preventative measures that can be adopted to reduce risks of seeps forming; and
3. Remediating existing seeps via decision support for farmers to select best management option(s) to use on areas affected with saline seeps.

**Figure 1:** Saline seeps near Mannum and Wynarka, SA in January 2019 including the management option of using a sorghum and millet mix to increase water use over summer in targeted areas of a paddock showing evidence of high soil water content. A soil core collected in a Mallee saline seep in January 2019 showing a fully saturated soil profile.

*This saline seep project is supported by Mallee Sustainable Farming, through funding from the Australian Government's National Landcare Program and the Grains Research Development Corporation and the SA Murray-Darling Basin Natural Resources Management Board*

**Contact:**
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# The challenges of soil residual herbicides.

David Keetch (NuFarm Ltd) & Craig Davis (Agronomy Consulting)

(Adapted from Hart "Getting the crop in" seminar presentation 2019.)

Predicting the persistence of herbicides in soil can be difficult. Many factors influence the duration of herbicide persistence in soil.

- Soil pH, texture, organic matter, other constraints.
- Climatic conditions particularly temperature and moisture
- Chemistry involved and how it is degraded
- Modelling assists predictions, as can soil tests, bioassays & pot tests.

(Refer to "SOIL BEHAVIOUR OF PRE-EMERGENT HERBICIDES IN AUSTRALIAN FARMING SYSTEMS" a GRDC article for detailed information.)

Degradation pathways for herbicides.

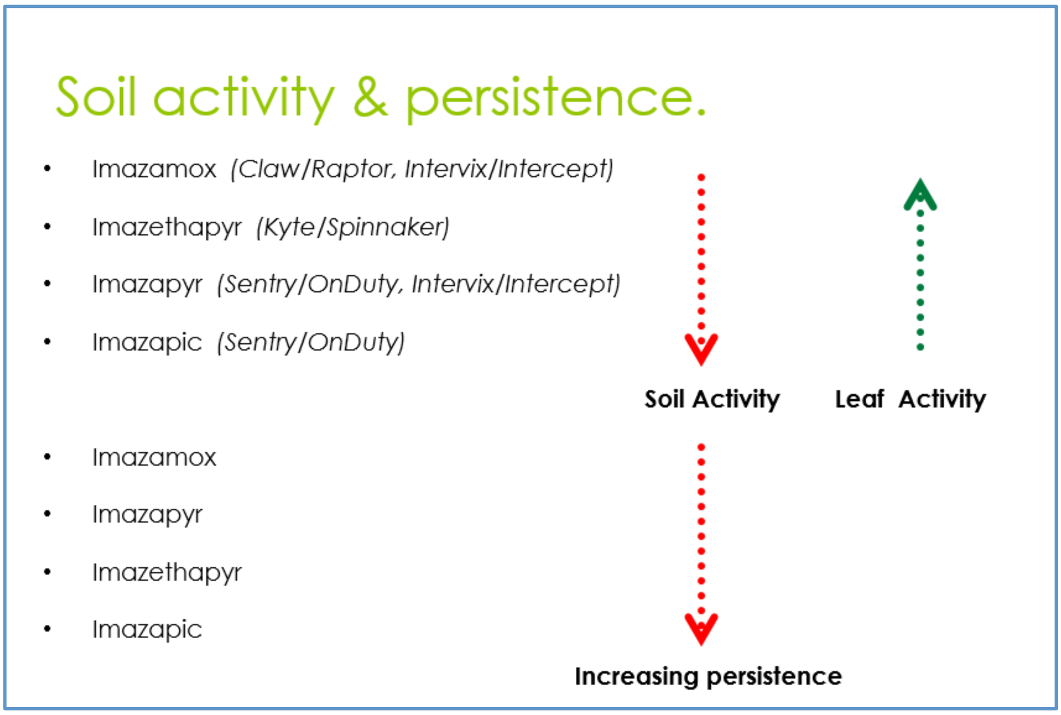
- Microbial degradation
  - Maximised in warm soil with persistent moisture, adequate oxygen, organic matter, nutrients and neutral pH.
  - Maintaining soil moisture levels for sufficient length of time critical – one off showers are no/little use.
- Chemical hydrolysis
  - Related to temperature, soil moisture & soil pH.
- Photodegradation
- Volatility

Potential to reduce residual risk.

- Repeated use of some herbicides may elevate populations of specific microbes that can break down that herbicide.
  - Persistence of the herbicide may be reduced.
    - Shorter plantbacks to sensitive crops possible, but length of residual weed control will be shortened.
  - Eg. Atrazine and propyzamide, however other herbicides may also be affected.
  - Cultivation which stimulates degradation and dilutes herbicide residues could potentially be effective, but it is not recommended to rely solely upon.

A specific case example – Imidazolinones (IMI’s).

- Mainly degrade through microbial degradation
    - Soil moisture & temperature the major contributors.
    - Acid soils can show greater persistence as the active binds more tightly in soil.
- Large variation in IMI persistence
    - Exploitable with extended residual On-Duty® /Sentry® Vs Intercept/Intervix®.
    - ~9-34 month plantback to sensitive crops.
    - Large variation in required rainfall ~150-750mm.
- Use pattern can assist in managing residual risk
    - Pre-sowing Vs post emergent.




IMI "watch outs"

- Autumn rain can be dangerous – moves residues into the soil solution and can affect the new crop.
- Avoid group B’s in year following.
- Highest risk crops are non-CL canola, non-CL cereals (Oats>Barley>Durum>Wheat>Triticale) & non tolerant pulses.

        - Safest options are IMI tolerant crops, pulses.
            - Faba Beans/Field peas, clover > lupins > medic > chickpeas > non-XT lentils

2018 provided similar plantback problems to those arising this year.

    - Low spring rainfall.
    - Low or non-existent summer rainfall.
    - Delayed/patchy break in autumn.
- The spring & summer fallow periods provide the biggest breakdown opportunities for herbicide residues.
    - Don't underestimate autumn breakdown potential.
    - As a rule growing season rainfall more reliable though.
- Remember, you cannot count all rainfall.
    - Isolated rainfall events without follow up is not effective.

The importance of record keeping.

- **Maintaining regular spray records is now a legal requirement under the new APVMA labelling requirements for pesticides**
- Records provide an excellent management tool because operators can compare the results of spray jobs for product performance and resistance monitoring.
    - Good records allow the operator to assess the effectiveness of various tank mixes over time and in specific paddocks.

Detailed spray records allow back checks to determine where plantback restrictions may occur on the farm.

Take homes.

- A large array of herbicides used in current farming operations have the potential to restrict follow crop options.
- Keep good records of applications & weather conditions.
    - Measure, record and retain good rainfall records.
- Understand your soils and assess risk before applying residual herbicides.
- Assess risk of follow crop restrictions before planting sensitive crops. Plan early.

Australian Government
Department of Agriculture and Water Resources

Crop Science
Zoom Meeting

# National Residue Survey Grains Program Report

Ian Reichstein, Director

April 2019

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## Australia's residue management framework

**Registration of pesticides and veterinary drugs**
APVMA

**Control of use of chemicals**
State Government agriculture department

**Verification of good agricultural practice**
National Residue Survey (NRS)

**Traceback and chemical review**
APVMA, NRS, State governments

NRS
Supports market access
Independent audit of residue integrity

## Key Grain Program objectives:

- no legislated requirement for a grain residue monitoring program
- voluntarily elected to establish NRS grain levy = 0.015% (total 1.015%)

- Industry elected to make participation mandatory for:
  - Market access - export grain
  - Quality assurance - domestic grain

- Provides accumulated residue testing data to:

  **demonstrate long term integrity of Australian exports**

## NRS grain programs – why?

Covers all known grain streams

- Export container / bulk - 75% of samples
- Domestic - human consumption, feed mills, flour mills, maltsters

**Industry philosophy - to avoid these situations**

# NRS grains program

Covers all tradeable grains

Cereals: wheat, barley, maize, oat, sorghum, triticale

Pulses: bean (broad, mung, navy) and pea (field, cow, chick, pigeon), lentil, lupin, vetch

Oilseed: canola, safflower, linseed, safflower, soybean

# NRS Grains program

Funded by producer levy
0.015% of the 1.015% farm gate levy = $1.5m per annum

Export samples
Samples are a subset of the representative sample collected for phytosanitary assessment

**Bulk:** >3000 samples per annum (each hatch from every ship loaded at export terminals)

**Container:** >2000 samples per annum (consignments loaded at packing sites)

Domestic
Milled products, feed mills (stockfeed), feedlots, food processing, oilseed crushers, maltsters

Average of 800 samples per annum

# NRS grains program results

| | Bulk Export | | Container Export | |
|---|---|---|---|---|
| Year | Samples | *Compliance (%) | Samples | *Compliance (%) |
| 2005-06 | 2953 | 100.0 | 89 | 100.0 |
| 2006-07 | 2085 | 100.0 | 168 | 100.0 |
| 2007-08 | 2055 | 100.0 | 565 | 99.6 |
| 2008-09 | 2621 | 100.0 | 391 | 98.2 |
| 2009-10 | 2673 | 99.8 | 827 | 98.3 |
| 2010-11 | 3302 | 99.8 | 821 | 98.9 |
| 2011-12 | 4005 | 99.9 | 886 | 99.0 |
| 2012-13 | 3802 | 99.8 | 1229 | 98.9 |
| 2013-14 | 3351 | 99.7 | 1802 | 98.9 |
| 2014-15 | 3452 | 99.9 | 2034 | 98.8 |
| 2015-16 | 2900 | 99.7 | 2284 | 98.8 |
| 2016-17 | 4166 | 99.8 | 3755 | 99.0 |
| 2017-18 | 2948 | 99.8 | 2029 | 99.0 |
| 2018–19* | 1611 | 99.8 | 924 | 99.6 |

GLORY GLORY



# Analytical screens – new compounds

CURRENT

Program 49 - multi-residue screen – all samples

- Fungicides (e.g. fluquinconazole, flutriafol, iprodione)
- Herbicides (e.g. pre-emergent and post-emergent – 2,4-D, simazine, pendimethalin)
- Contaminants (e.g. organochlorines – DDT, dieldrin, lindane)
- Insecticides (e.g. grain protectants, in-crop uses – chlorpyrifos-methyl, indoxacarb, spinosad)

Program 49H - special herbicide screen – tailored

- e.g. glyphosate, haloxyfop, glufosinate, paraquat, diquat, fluazifop, amitrole

**ADDITIONS**

**Program 49**

- **Fungicides – carboxin, bixafen, fenbuconazole, penflufen, sedaxane**
- **Herbicides – 2,4-DB, aminopyralid, bentazone, butroxydim, flumoxazin, fluroxypyr, terbutryn, triallate**

**Program 49H - propaquizafop**

**New compounds in 2018-19:**

- **Cyantraniliprole, Fenbuconazole, Flonicamid (including metabolites), Fluopyram, Mandestrobin, Novaluron, Triforine**

# Residue Detections in Barley Nationwide

| 2012-2013 | | | 2017-2018 | | |
|---|---|---|---|---|---|
| Analyte | No. of detection | Detection rate | Analyte | No. of detections | Detection rate |
| glyphosate | 41 | 4.1% | **glyphosate** | **221** | **20.2%** |
| fenitrothion | 182 | 18.4% | fenitrothion | 140 | 12.8% |
| piperonyl butoxide | 173 | 17.5% | piperonyl butoxide | 192 | 17.6% |
| deltamethrin | 103 | 10.4% | deltamethrin | 68 | 6.2% |
| methoprene | 66 | 6.7% | methoprene | 82 | 7.5% |
| chlorpyrifos-methyl | 25 | 2.5% | chlorpyrifos-methyl | 55 | 5.0% |
| cypermethrin | 18 | 1.8% | cypermethrin | 18 | 1.6% |

*Testing for metals and phosphine was postponed from 1 July 2017

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# Haloxyfop - canola

| | Samples | > LOR < MRL | > MRL | Compliance % | Highest detection (mg/kg) |
|---|---|---|---|---|---|
| 2009-10 | 70 | 23 | 3 | 95.7 | 0.30 |
| 2010-11 | 62 | 37 | 5 | 91.9 | 0.19 |
| 2011-12 | 55 | 25 | 2 | 96.4 | 0.20 |
| 2012-13 | 83 | 44 | 8 | 90.4 | 0.58 |
| 2013-14 | 131 | 47 | 11 | 91.6 | 1.7 |
| 2014-15 | 119 | 52 | 7 | 94.1 | 0.91 |
| 2015-16 | 185 | 83 | 18 | 90.3 | 1.5 |
| 2016-17 | 314 | 110 | 7 | 97.8 | 0.62 |
| 2017-18 | 231 | 121 | 21 | 90.9 | 0.55 |
| 2018-19* | 98 | 19 | 8 | 91.8 | 0.76 |

APVMA MRL = 0.1mg/kg, LOR = 0.01mg/kg, highest detection was 1.7 mg/kg (Codex MRL 3 mg/kg, Japan / Taiwan 0.1 mg/kg)

Haloxyfop product label changes were put into effect on 03/10/2014 with a 12 month phase-out of existing stock

## Flutriafol-all grains

| | Samples | > LOR < MRL | > MRL | Compliance % | Highest detection(mg/kg) |
|---|---|---|---|---|---|
| 2009-10 | 4539 | 6 | 4 | 99.91 | 0.09 in wheat |
| 2010-11 | 5055 | 5 | 8 | 99.84 | 0.25 in wheat |
| 2011-12 | 5868 | 3 | 6 | 99.90 | 1.4 in wheat |
| 2012-13 | 5896 | 16 | 19 | 99.68 | 3.4 in oat |
| 2013-14 | 6096 | 11 | 10 | 99.84 | 1.2 in wheat |
| 2014-15 | 6279 | 13 | 16 | 99.75 | 0.88 in wheat |
| 2015-16 | 6221 | 28 | 29 | 99.53 | 1.2 in wheat |
| 2016-17 | 8822 | 40 | 34 | 99.61 | 0.24 in canola |
| 2017-18 | 5857 | 40 | 9 | 99.84 | 0.39 in wheat |
| 2018-19* | 2653 | 14 | 0 | 100 | 0.059 in canola |

APVMA MRL = 0.1 mg/kg (except barley – 0.2 mg/kg and canola – 0.07mg/kg), Codex MRL (wheat 0.15 mg/kg, canola 0.5 mg/kg)

**ARE THE REMEDIAL INITIATIVES WORKING?**

## Some other residues of note – 18/19

| | Samples with detections | HR - mg/kg | Grain Products |
|---|---|---|---|
| carbaryl | 4 | 0.22 | wheat bran, wheat, chickpea, canola, sorghum |
| carbendazim | 41 | 0.12 | lentil |
| chlorpyrifos | 1 | 0.034 | Wheat (Durum) |
| CPM | 181 | 6.1 | Cereals |
| cypermethrin | 70 | 0.2 | Sorghum |
| deltamethrin | 108 | 0.96 | Cereals, canola |
| fenitrothion | 97 | 3.7 | Cereals |
| imidacloprid | 14 | 0.24 | All grains |
| paraquat | 8 | 0.094 | Pulses |
| procymidone | 13 | 0.023 | Pulses |
| spinosad | 84 | 0.46 | Cereals |
| | | | |

# Global issues - Missing MRLs

Scenario 1 - New chemistry

- missing MRL arises from a decision of a registrant / chemical manufacturer to not seek registration of a pesticide for use in importing country
- missing MRLs also created when registrant seeks pesticide registration in an importing country but only for a limited selection of crops

Scenario 2 – older chemistry
Missing MRL arises where a country / bloc reviews old chemistry and decides to revoke / set to default MRLs

Scenario 3 – minor crops – small production volumes do not provide sufficient economic incentive to register use patterns.

Scenario 4 – divergent MRLs

<u>Impediments</u>
Reliance on Codex MRLs, lack of national pesticide regulatory system, cost of import MRL application

<u>Initiatives</u>
APEC guidelines on import MRLs

# MEDIA RELEASE

## June 2019

## GRAIN AND FODDER INNOVATORS ENCOURAGED TO ENTER AWARDS

Farmers, agronomists and crop producers are encouraged to enter the National Grain & Fodder Innovation Awards as part of this year's Royal Adelaide Show.

The Nufarm National Grain Innovation Award and the Pasture Genetics National Fodder Innovation Award recognise growers across Australia who have redeveloped their farming practices to adapt to change, increase production and/or demonstrate sustainability. Entries can be submitted in written or video form and may feature innovative practices for pest or weed management, innovative machinery, or forward-thinking environmental management practices that lead to sustainable farming.

The inaugural winners of the 2018 Awards were Tom Robinson from Hoyleton for his work in diverse rotational mixes, and Brenton McRae of Kadina for harvesting storm water for lucerne and fodder irrigation.

Deputy Chair of the Grains and Fodder Committee, Peter Smith, said both innovations demonstrated the deliberate application of information and resources in a new manner, leading to more sustainable farming and production.

"We know that all producers have to be innovative to remain both economically and environmentally sustainable in their production. Today's conditions require constant innovation and review of practices, so we encourage those in the industry to share their story and be rewarded."

All entries will be assessed by an independent industry representative, along with representatives from the RA&HS Grains & Fodder Committee, Nufarm and Pasture Genetics.

The winner of the Nufarm National Grain Innovation Award will receive funding to the value of $5,000 toward an overseas study tour to further the winner's knowledge of innovative farming practises. The winner of the Pasture Genetics National Fodder Innovation Award will receive proprietary seed product to the value of $3,000 and a one-on-one on-farm agronomic consultation.

"These Innovation Awards are an important recognition of young farmers who are developing progressive and sustainable improvement on their farms," Mr Smith said.

Competition information can be found at [www.theshow.com.au/grains-fodder](www.theshow.com.au/grains-fodder). Entries close at 5.00pm ACST on Friday 26 July 2019.

Winners of the Nufarm National Grain Innovation Award and the Pasture Genetics National Fodder Innovation Award will be announced during the 2019 Royal Adelaide Show.

**Media Enquires:**
**Peter Smith, Deputy Chair, Grains and Fodder Committee – RA&HS, ph: 0411 127 478**
**Kirrilee Hay, Marketing Manager – Royal Adelaide Show, ph: 0499 773 512**