PGT
POPPY GROWERS
TASMANIA INC

The Official Journal | Issue #7: 1st October 2022
Previous edition: #7 | 6th September 2022

Poppies:
A Proud Tasmanian Industry

inside:

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Welcome to the October 2022 Edition of In A Capsule News!

PGT appoints new Chief Executive

The President of Poppy Growers Tasmania (PGT) Michael Nichols is delighted to announce that Howard Nichol has been appointed to succeed Keith Rice as the organisations Chief Executive.

Howard will commence in early November and work alongside Keith until he retires at the end of January 2023.

Photo. Howard Nichol

Howard brings to the role extensive experience in working closely with PGT and with many of Tasmania's plant-based agricultural sectors, regional communities and membership-based organisations.

Howard has a Bachelor Degree in Agricultural Science and worked for a number of years as an Extension Officer with the Victorian Department of Agriculture and then as a Rural and Regional Industries advisor with Victorian Regional Economic Development agencies before moving to Tasmania.

Whilst working with Northern Tasmanian Development, Howard wrote the North East Tasmanian Economic Development Plan, and on its completion, he was invited by the Tasmanian Department of Economic Development to implement its recommendations through the Dorset Economic Development Group.

A key requirement of this role was to work with and support farmers during the development of the region's irrigation schemes as well as the identification of on -farm opportunities 'Beyond the Tap'.

In July 2013 Howard joined the Department of Primary Industries, Parks, Water and Environment (DPIPWE) as AgriGrowth's Plant Industry Analyst. Over the ensuing eight years he was responsible for providing relevant Ministers with accurate and timely industry updates, reports and input into policy formulation relating to all plant based agricultural sector issues.

During this time Howard worked closely and collaboratively with PGT, the poppy processing companies and with research agencies including the Tasmanian Institute of Agriculture (TIA) on a range of projects and initiatives including:

- production of DPIPWE's 'Best Practice Poppy Growing Guide'
- assisting with the Poppy Industry Reform – Poisons Amendment Act
- co-ordinated the review and establishment of new Poppy Licence Requirements
- provided the Government with detailed information and data opposing the growing of poppies on mainland Australia, and on the importation of Concentrated Poppy Straw from overseas
- in collaboration with PGT was responsible for bringing together growers, processors, research agencies and Government as an urgent response to the initial outbreak of Systemic Downey Mildew
- inaugural member of the Poppy Industry Public Safety and Education Committee (PIPSEC)

Howard's farming, science, economic development and Government background means that he brings to this role a detailed understanding of Tasmania's agricultural sector – including the poppy industry – and an informed understanding of the processes and practices of Government policy development.

Howard grew up on a farm in far north-east Victoria and continues his connection with the land through his small Tamar Valley property on which he has a 2,500-tree cherry orchard, a cut flower lily business, a flock of little 'Babydoll Southdown sheep', border collie dogs, ducks, chickens and geese.

I welcome Howard to his new role with PGT and I am looking forward to working with him in support of our PGT members as we strive for improved sustainability, productivity and profitability.

Systemic Downy Mildew (SDM)

As promised in the September edition, please find attached a brief summary of the final project report prepared by Dr Jason Scott, Senior Research Fellow, Tasmanian Institute of Agriculture, University of Tasmania on behalf of the Project Team.

We also take this opportunity to congratulate the following two PhD students who conducted research into SDM as part of this project. **Dr Krithika Krishnamoorthy,** who graduated in 2021. **Miss Dharushana Thanabalasingam,** who is awaiting final acceptance of her thesis and will graduate this year.

Systemic Downy Mildew of Poppy

Systemic downy mildew, SDM for short, was first observed as a problem in 2013 and became a serious issue for the industry in 2014. Such was the severity of the disease and the concern within the poppy industry, the Tasmanian Institute of Agriculture (TIA), part of the University of Tasmania (UTAS) was tasked to investigate the problem. This resulted in a $1.2M, 5 -year research project which commenced in 2017 with completion earlier this year. Work was funded by the Australian Government through the Australian Research Council Linkage Program with significant cash and in-kind support from the Tasmanian Government, Extractas BioScience, Sun Pharma and Poppy Growers Tasmania.

This project was designed to provide the poppy industry with some answers to fundamental questions about the disease and provide growers with guidance on how the to best manage the disease. The project ran parallel to work conducted by the poppy companies to provide better fungicide controls for managing the crop in season.

The following is a brief summary of the project's findings and their implications for Tasmanian poppy growers.

What is systemic downy mildew?

SDM is a disease affecting poppies around the world. It causes stunting and twisting of poppy plants, and severe cases kills the plant dead. It is a different disease to the old downy mildew found in Tasmania for many years, which causes brown spots on leaves and we now call localised downy mildew.

It has been identified that SDM is being caused by an oomycete fungus, *Peronospora somniferi*, which is different from the downy mildew fungus that causes localised downy mildew *(Peronospora meconopsidis*). It is not known how long the SDM pathogen has been found in Tasmania, although testing of historical samples has found it in seed harvested from 2012. It likely that SDM had been slowly building up over many years before it got to the point where it was causing a noticeable problem.

Image. *A stunted poppy plant affected by SDM*

How does downy mildew spread?

There are many different methods that downy mildew fungi use to spread between crops and seasons. The methods that apply to SDM in poppies are: i) seed; ii) soil; iii) weeds and regrowth; and iv) airborne spores. The first three methods are all important drivers of the diseases survival and spread across cropping season. The last two methods are drivers of how the disease spreads once a crop has been sown and emerged from the ground.

Seed

Examination of poppy seed sources has shown that the fungus responsible SDM is often present when seed has been harvested from contaminated crops. Sowing this contaminated seed into fresh ground will result in SDM infecting the newly emerging plants. However, treatment of poppy seed with heat or chlorine-based treatments like bleach or electrolytic water have been demonstrated in our studies to reduce transmission of SDM from seed by up to 90%. In untreated seed, typically about 50 out of a thousand seedlings are infected by SDM when seed is untreated. When treated with electrolytic water, this is reduced to 6 out a thousand. This is achieved without compromising the emergence of poppy seeds after treatment.

Soil

The downy mildew fungus can survive as spores in the left-over poppy trash from crops. If this trash is reincorporated into a paddock the fungus can survive several years, dormant waiting for contact with a growing poppy plant. If a short rotation is employed (2 years or less between poppies), insufficient time has elapsed for the spores in the soil to die off and there is a very high risk of SDM in a new crop. After 3-4 years of no poppies the risk of SDM in a new crop is much reduced, but some SDM spores will still be living. After 5 years, the level of living spores is typically negligible.

Image: *A comparison of SDM affected poppy seedlings growing in soil infested with SDM spores (top row) with healthy seedlings of the same age grown in clean soil (bottom row).*

Weeds and regrowth

Weed poppy species, like red poppies, and regrowth poppies can be infected by SDM. This means that when they die, they put fresh SDM spores back into the soil the same way that a crop does. A flush of weed and/or regrowth poppies in a paddock effectively restarts the timer for the rotation between poppy crops. A good rotation between poppy crops should include rapid clean up of these plants as soon as possible.

Weed and regrowth poppies also play a role in spreading SDM if they are present in the headlands or in nearby paddocks during the cropping season. This because the infected plants can form spores on the undersides of leaves that can then spread on the wind.

Image: *A regrowth poppy growing during July. This was infected by SDM and a ready source of fresh spores.*

Airborne spores

When a poppy plant is infected by SDM, spores are formed on the undersides of the poppy leaves. Unlike the soil borne spores, these are short lived (approximately 24 hours), but can be spread on the wind, infecting neighbouring plants both in the same paddock and in neighbouring paddocks. These spores are favoured by mild temperatures and most importantly moisture. Misty rain, fog and dewy mornings all favour the spread SDM. Under favourable conditions the time between a plant becoming infected and forming fresh spores can be as little as 7 days. These means that if a crop is not properly protected by the right fungicides SDM can build up in a crop rapidly.

How to control downy mildew?

Control of SDM can be broken down into two areas: i) decisions made pre-planting; and ii) decisions made after planting.

Pre-planting

The choice of paddock to sow a poppy crop into is the first critical decision for controlling SDM. If the paddock chosen is on a short rotation (less than 3 years between poppies), there is a big risk that the new crop will be damaged by SDM. A paddock on a medium rotation (3-4 years) has smaller risk of damage, but the risk is not zero.

Giving paddocks adequate time (ideally 5 years or more) between crops to allow SDM spores to die in the soil is a key method to control SDM.

Similarly, if weed poppies or a flush of regrowth poppies have been allowed to grow in a paddock, the risk of crop damage by SDM grows. Removing regrowth and weeds from a paddock as soon as they occur minimises this problem.

Treatment of commercial seed prior to planting is a decision that both Sun Pharma and Extractas BioScience make as providers of the seed. This removes the need to for grower action here and helps minimise the risk that infested seed poses to the industry.

After planting

Once a crop has been sown and is coming out of the ground, growers have two tools at their disposal for controlling SDM: i) timely application of fungicides; and ii) removal of weed and regrowth poppies from headlands and nearby paddocks.

Spread of airborne spores can occur rapidly when temperatures are mild (10 – 20°C) and damp. If poppy plants are not protected when overnight misty rain, fog or dew occurs, SDM can take off rapidly. Deciding to delay fungicide applications under these conditions greatly increases the risk of SDM causing damage to a crop.

Experiments how shown that poppies can be infected be infected by SDM and appear healthy. However, if they are then stressed, for example by putting on a herbicide spray or by growing in waterlogged soil, the SDM symptoms occur.

Waiting for the disease to appear within a crop before applying fungicides can be a risky decision if the weather is favourable for SDM.

Poppy crops also need to be protected when they are young. Work over a number of years has shown that early season infections of poppies are by far the most damaging to the crop. Plants at the 10-leaf stage or younger are much more susceptible SDM than plants that have reached hook or later grow stages. So, while later application of fungicides can provide some protection, early sprays to protect a young crop are critical.

Leaving regrowth poppies and weed poppies growing near a new poppy crop is another risky decision. Even if a paddock has no history of poppies and clean seed is sown into, the crop sown into it is not immune from SDM. If infected regrowth plants are growing nearby, these can infect a healthy crop. Removing these plants as soon as possible to prevent them producing SDM spores is the best method of protecting a crop, especially young crops.

Identifying the risk of SDM

To help growers with their management decisions for SDM the below risk tables have been developed based on the findings of our research. The tables provide guidance of the impact of decisions made pre-planting and after planting. The stars (*) in the table indicate the level of risk for an option and are additive for each part. One to two stars is considered low risk, three to four stars medium risk and five or more stars high risk.

Pre-planting

Pre-planting decision		Risk
Rotation length	1 year	*****
	2 years	****
	3 years	*
	4 years	*
	5 years	
Seed	Commercially treated seed	*
	Untreated seed	***
Regrowth/weed poppies	Present in the last 12 months	**
	Present in the last 2 years	*
	3+ years with no regrowth	

Example 1:

If a grower chooses to sow after a 2-year rotation (****), with commercially treated seed (*) and a flush of regrowth poppies was present in the paddock 2 years ago (*), this would equal six stars (******), an extremely high pre-planting risk!

Image. *Dying poppy plants infected by SDM*

Example 2:
If a grower chooses to sow after a 5-year rotation ( ), with commercially treated seed (*) and no regrowth has been present for 3 years ( ) this would equal one star (*), a low pre-planting risk of SDM.

After planting

After planting decision		Risk
Overnight moisture occurring	Early season (< 10 leaf plants)	
	No fungicide protection	**
	Fungicides applied	
	Late season (>10 leaf plants)	
	No fungicide protection	*
	Fungicides applied	
Regrowth/weed poppies	Left to grow early season	**
	Left to grow late season	*
	Not present	

Example 1:
If a grower chooses to skip a fungicide spray and leaves a 8-leaf crop unprotected during a heavy dew event (**) and there are regrowth/weed poppies growing in the neighbouring crop (**) this equals four stars, a medium risk of crop damage by SDM.

Example 2:
If a grower chooses to skip a fungicide spray and leaves a 10-leaf crop unprotected for two dewy nights (**) plus (**), and there no regrowth/weed poppies growing nearby ( ) this equals four stars, a medium risk of crop damage by SDM.

Example 3:
If a grower chooses to skip a fungicide spray and leaves a flowering crop unprotected during a heavy dew event (*) and there are no regrowth/weed poppies growing nearby ( ) this equals one star, a low risk of crop damage by SDM.

Example 4:
If a grower chooses to skip a fungicide spray and leaves a flowering crop unprotected during a heavy dew event (*) and there are regrowth/weed poppies growing nearby (*) this equals two stars, a low risk of crop damage by SDM.

Image. *A healthy poppy crop*

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In Conclusion

We wish all growers the best for the coming 2022/23 season.

Kind regards,

Michael Nichols

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