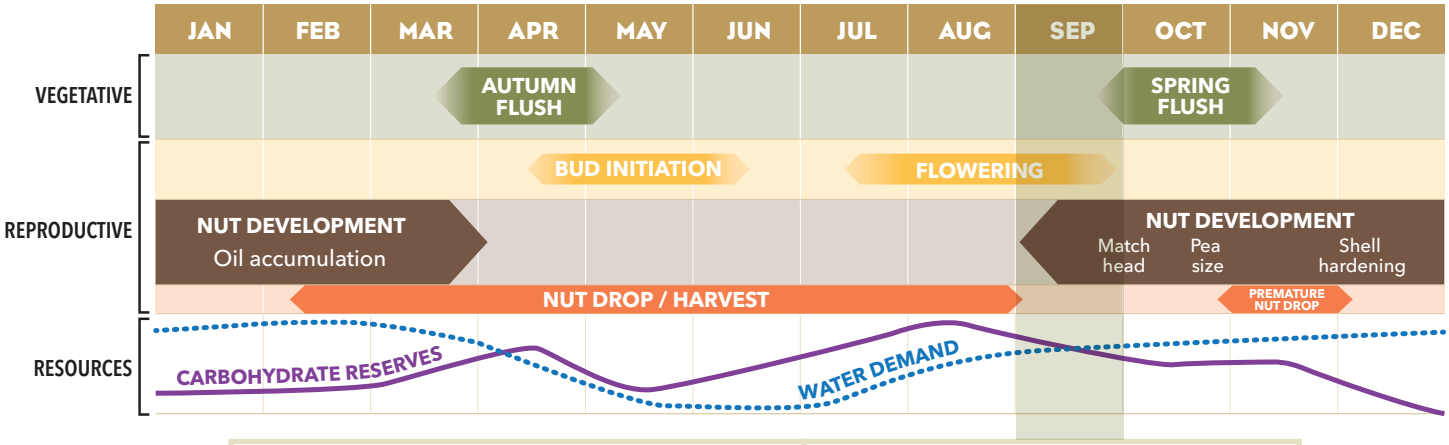
Phenological Cycle



Trees are flowering with nut set from mid-month

Spring flush will be triggered by warming temperatures

Water demand is increasing

Pest & disease

Monitor weekly to fortnightly for pest and diseases that affect **flowers**. Pest and disease risk increases where there is a **previous history** of the problem and with **larger canopies** that are harder to manage and monitor. Below is a flower risk assessment:

Flower pest risks

High risk	Lace bug	• SEQ/NSW regions • Closed canopies/dark orchards • Low-moderate populations can cause significant crop loss
Moderate risk	Flower caterpillar	• QLD regions • Sporadic with populations able to increase rapidly • Often controlled naturally
Low risk	Felted coccid, thrips and aphids	• Generally low flower risks, but large populations (in young trees particularly) can cause damage • Many natural predators, but these are impacted by highly disruptive sprays/control

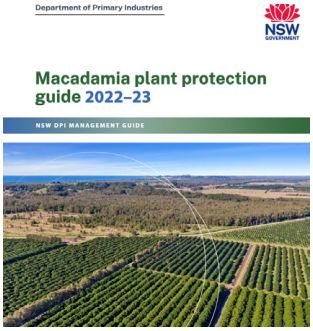
Flower disease risks

High risk	Grey mould (*botrytis*)	• Cool (<22°C) wet/humid (>70% RH) conditions • Open flower stages (3 & 4)
	Green mould (*cladosporium*)	• Warm (22 - 27°C) humid (>60% RH) conditions • All flower stages
	Dry flower (*pestalotiopsis complex*)	• Warm (24 - 30°C) dry (>40% RH) conditions • All flower stages
Low risk	Grey mould (*botrytis*)	• Warm (>22°C) dry (>60% RH) conditions • Closed flower stages (1 & 2)
	Green mould (*cladosporium*) Dry flower (*pestalotiopsis complex*)	• Cool (>22°C) dry (<50% RH) conditions

The risk period for **lace bug** is from **pre-flowering** to **peak flowering**. A **lace bug** female lays dozens of eggs in a week, and they can each reach maturity in as little as eight days. **Darkened or shrivelled** damage on flowers is a tell-tale sign of lace bug damage.

If you have known **hotspots**, pay close attention to them first. Best practice is to select control strategies that have the **least impact** on non-target species. This includes **spraying at night** when bees are not active and not during open flowering. Always talk to your beekeeper before applying any pesticides.

Broad-spectrum products that have a long residue, such as diazinon, are **highly toxic** to beneficials for several days after application. There are safer, new options that are less disruptive. Discuss options with your pest consultant or grower liaison officer.



If you haven't got a copy, download the *2022-23 Macadamia Plant Protection Guide.*

If you're still harvesting, be aware of **withholding periods** when considering any crop protection strategy. Ignoring withholding periods is illegal and may lead to kernel residue issues and your crop being refused by your processor.

In Queensland **flower caterpillar eggs** are already being found and, as conditions warm, their life cycles shorten, meaning there will be more generations present. **Sticky webbing** and **clumping of flowers** with caterpillar frass are the tell-tale signs. Once you have reached a threshold of roughly 50% of flowers infested (site dependent), consider intervention. Remember that most chemical options, including the caterpillar-targeted product methoxyfenozide (e.g. Prodigy), can be applied at the egg stage due to their residual effect.

Crop inputs

Best practice during flowering is to bring **managed pollinators** into the orchard to assist naturally occurring pollinators and hives that remain year-round. What was your **stocking rate** this season? This depends on many factors but to maximise cross pollination aim for:

- **European honey bees** - Two to five strong hives per hectare spread out around the orchard. Don't assume hives are strong, rather confirm this with your beekeeper. Hives that are rundown with few bees will be **inefficient pollinators** and more hassle than benefit.
- **Native bee** – Positioning hives every 500 m as they have a small foraging range, and they need to be positioned with **early morning sun** as they are notoriously slow starters.

During spring, biological processes and input demands will increase.

Water demand. Tree water demand is increasing, and you need to put in place every moisture retention strategy you can. If **water availability** is reduced or you have an irrigation system such as drip that only waters a small portion of the root zone, start monitoring seven-day weather forecasts and apply water before hot dry days are predicted to reduce **tree stress**.

Daily water use depends on **weather conditions, tree canopy** and **cultivar**. In general, mature trees use between 30 and 70 L a day, but other crucial factors such as **soil type, orchard floor covering** and **irrigation scheduling practices** also influence water availability. Simple soil monitoring tools such as GDots are inexpensive and provide valuable information.

Macadamias don't show obvious signs of water stress, and the rule of thumb is **less, more often**.

Nutritional demand. Trees flower and flush using stored reserves and current photosynthesis. This needs to be supported with good nutrition leading into the **spring flush** period. Developing nutlets have a high demand for nutrients such as **potassium**, so apply a good proportion of your annual **potassium** budget in the first three months following flowering. Discuss this with your nutrition consultant, including the option for **spring soil and leaf sampling**.

Water use in mature trees

The benefits of applying **organic matter** cannot be understated. What is your **organic matter application plan** for this spring? Remember to minimise flower contamination from dust if applying organic matter during open flowering.

Mill mud is likely no longer available from sugar mills (unless you are also a cane grower).

Mechanical

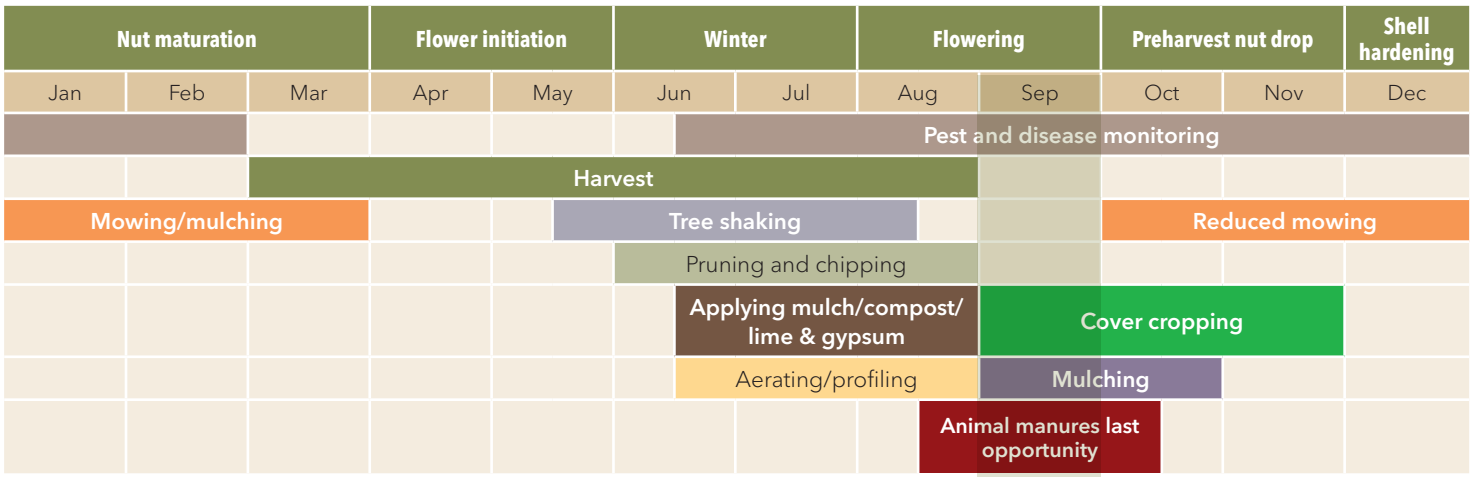
All preparation for **spraying** should now be complete and your equipment **calibrated** and ready to go. If you rely on a contractor, have all the arrangements in writing and a clear understanding of how they will operate, being mindful that you are **LEGALLY RESPONSIBLE** for any activities on your property.

With spring comes grass growth and options for **improving orchard floor** covering. Check your **mower/slasher**, ensuring:

- **blades** are in good condition
- **bolts** are firm and not worn
- **gearbox** oil is at the correct level
- **universal joints** on the PTO shaft are greased and in good condition
- your **PTO cover** complies with workplace health and safety standards
- you check hours of operation for **self-driven mowers** to see whether a service is due.

We are realising the many benefits of letting **ground cover** grow. Consider **reduced mowing strategies** such as alternate row mowing and allowing grass and other inter-row species to flower. This will build up a habitat for beneficials and improve orchard floor moisture retention.

Management Cycle



Management

Keep in contact with your pest consultant who will be regularly monitoring your orchard. Consider **IPDM** strategies such as:

- canopy management
- improving hygiene
- creating beneficial harbours
- drop sheet monitoring
- starting with softer chemistry, reserving disruptive products for the end of the season
- rotating chemical groups.

You are likely to be doing some sort of **canopy management** over the next few months. Remember to be safe. Ensure that all staff are **suitably trained** e.g. chainsaw operation certification, and that they are following your enterprise's safe operating procedures and wearing appropriate PPE.

The timing of **canopy management** is crucial and best practice is to avoid the at least **two weeks either side of open flowering**. Vegetative regrowth is a strong sink, at the expense

of flowering. Research shows the highest yield penalty when pruning at flowering.

The month ahead

Husk spot. You need to be ready for husk spot control the moment nutlets reach **match-head** size. The risk of disease is more likely if:

- your orchard has a **history** of husk spot
- you have **susceptible cultivars** and/or **stick tights**
- your January/February **orchard survey** of fallen nuts indicated a husk spot problem.

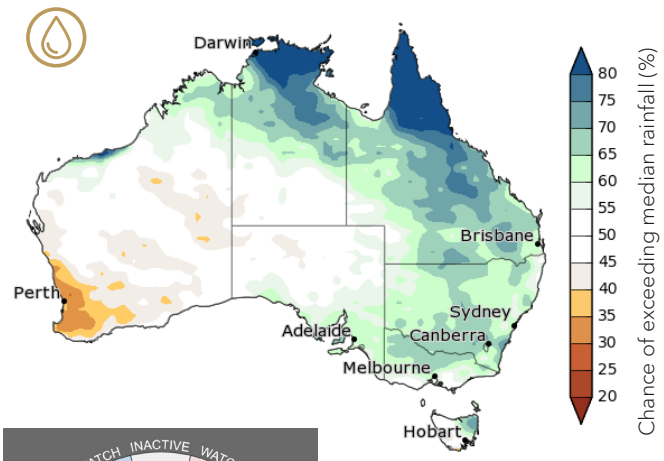
Match head may occur in the last week of September or into the start of October in warmer regions. Download the ***AMS/UQ fact sheet*** on husk spot.

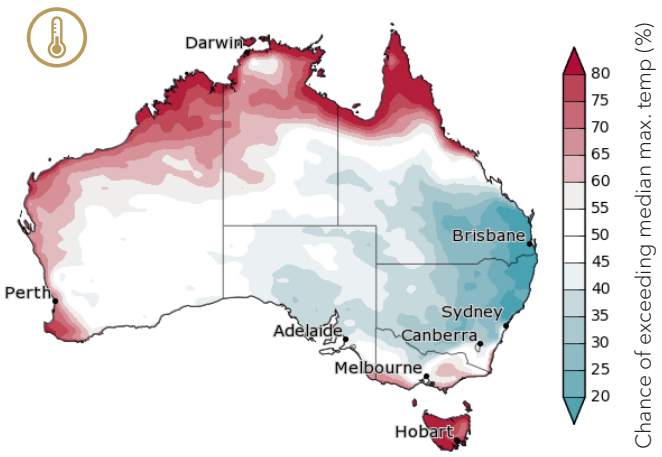
Macadamia seed weevil starts to become active when nutlets are at **match-head** size. Be prepared in the first week of October or earlier. There are reports of **seed weevil** being found in new areas such as Yamba since 2020. Know what to look for, i.e., the armoured weevil and the typical **triangular damage** it causes on the husk.

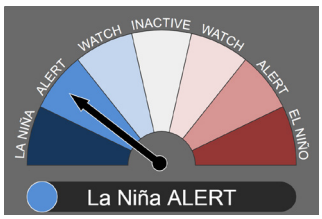
In Central to North Queensland, monitor for **banana fruit caterpillar** as soon as nutlets have set. Familiarise yourself with this pest and how to monitor and control it within the **leaf litter**.

Fruit spotting bug and **Leptocoris** have been highly damaging this year and you should get to know their life cycles. Understanding **neighbouring hosts, hot spots** and **monitoring** options is critical to inform timing of control.

BOM rainfall and temperature outlooks for October 2022







As of the end of August 2022, the Bureau of Meteorology is has increased the La Nina watch to alert status, with more that 70% chance that a La Nina will occur of the next few months.

Further Information

For more information, contact the AMS Industry Development Manager and/or your processor's grower liaison officer. Also, go to Industry Resources on the AMS website and search for fact sheets, research reports, Bulletin articles, case studies and more.

Hort Innovation
Strategic levy investment

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