

The impacts of severe and compound rain events on baby leaf crops



National Vegetable
Extension Network

VICTORIA - GIPPSLAND

Introduction

Warrick Purdon and Walter Chadwick are farm managers at Hussey & Co and Tripod Farmers respectively; two baby leaf farms located in Victoria's Gippsland region. Both growers have been significantly impacted by the severe and prolonged compound rain events that have occurred across the region over the last few months, and are willing to share the devastating impacts, gambles, and stresses that all baby leaf growers experience trying to produce high-quality baby leaf salads for supermarkets and wholesalers.

Significant rain events can have destructive consequences for baby leaf growers. The quality and supply of baby leaf salad into supermarkets and wholesalers can be substantially impacted for over eight weeks after a severe, prolonged, or compound rain event. From flooding and mud, to bruising and shredding, yellowing, disease, and root decay; the impacts of a severe rain event can be broad-reaching and universally devastating.

Initial losses

Immediate yield losses can be experienced following a significant or prolonged rain event due to everything being



A spinach crop turning yellow following a rain event.

simply too wet and muddy. Mr Chadwick noted that the adverse effects are stressful and deliver significant challenges. "The most instant impact is not being able to harvest something that is ready...you can't get a machine in, orders are in, the crop is ready; but you can't harvest it," he said.

"The most instant impact is not being able to harvest something that is ready."

-Walter Chadwick

Some areas of land can become too wet for machinery to access, while other areas might be accessible; however, a percentage of the crop may no longer be viable due to excessive mud or water. By the time a crop has become both accessible and harvestable, a farm may have already missed sales due to the delay, and the market can experience an immediate drop in supply volumes.

Baby leaf crops are very delicate and susceptible to physical crop damage from rainfall. The impact of heavy rainfall or hail on fragile salad leaves can cause significant bruising and tearing to occur almost instantaneously. Mr Purdon explained the potential extent of the impacts of severe rainfall. "Everything standing, everything that's of harvestable size is affected...even below harvestable size; anything that's out of the ground can be affected," he explained. "In the case of a crop like chard, rain can completely flatten it, making it physically incapable of being harvested for days, or even at all."

Here in Australia, we are accustomed to very high-quality produce, so any bruising or damage to salad leaves can cause rejections by wholesalers and supermarkets. Thus, at their most severe, these initial impacts can render multiple weeks' worth of supply destroyed and unsaleable in a matter of hours. This can have an unpredictable and very significant impact on supply volumes and quality for weeks after a rainfall event.

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Harvest 'spec' sheets detailing the different crops and their acceptable length range.

Baby leaf salads are grown to very stringent specifications for sale within the Australian retail market. In order for a farm to produce product that meets these standards, there is a very small 'spec window' for harvesting of compliant baby leaf crops. During summer, under normal growing conditions, the spec window can be as short as two or three days. This very small timeframe can become easier to comprehend when compared to the short lifecycle of most baby leaf crops. In the summer period, a baby leaf crop can go from seed to harvest in as little as 20 to 30 days. Once a crop has gone beyond its spec window, its sales viability is reduced significantly.

Intermediate crop health losses

After the initial mechanical and physical losses from a rain event, comes many weeks of significant crop health losses that can be hard to predict and difficult to manage. From yellow leaves, to weakened crops, stunted growth rates and root decay; the impacts on crop quality and yield do not stop for weeks and months after a significant rain event.

"The plant is being smothered by water and the lack of oxygen in the soil."

-Warrick Purdon

Yellow leaves are something growers are constantly fighting against in the weeks following substantial or ongoing rainfall. Baby leaf crops that are two to three weeks old do not like having 'wet feet'. Significant or ongoing rainfall can cause the ground to become waterlogged and the plants to have an oversupply of water and a lack of nutrients; causing the leaf to turn

yellow, explained Purdon. "The plant is being smothered by water and the lack of oxygen in the soil; the plant is not drinking, because it doesn't need to, so it's not getting the nutrients it needs," he said.

Growers are in a race against time; the soil needs to dry out so the plant can breathe, and growers can get nutrients to the crops as soon as possible to help delay or avoid a crop turning yellow. This race can be hampered by ongoing rainfall and machinery getting bogged, along with capacity and equipment limitations. The yellowing of a crop can happen very quickly and with our high supermarket standards, can render a whole crop unsaleable overnight.

When a crop's root system is saturated for an extended period, it can lead to root decay and cause significant yield and quality impacts over time, explained Purdon. "You end up with root damage; the plant sends out new roots to the surface to try and compensate for the excess water and the lack of oxygen in the soil," he said.

"This significantly impacts the supply of produce six to eight weeks after a weather event."

-Warrick Purdon

The plant's root system can decay to a point where it cannot fully recover, causing stunted growth. Purdon used lettuce as an example, outlining that due to root deterioration, lettuce will often not grow to full size after a significant or prolonged rain event, it will be stunted. "Instead of a six-to-eight-week growth cycle, it will need closer to eight weeks in the ground before it reaches minimum specification for harvest," he said. "This significantly impacts the supply of produce six to eight weeks after a weather event."

Growers do whatever they can to minimise or compensate for the effects of severe, prolonged, or compound rain events on crop health; however, sometimes a crop is beyond recovery. Chadwick highlighted the consequences of missing a spray or a fertiliser spread on a baby leaf crop due to rain. "It's the biggest challenge in baby leaf; there is no flexibility, especially in summer when the growth window is so short," he said. "You might get it to a harvestable size, but it can have insect problems, fungal problems or yellowing from lack of fertiliser."

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A rainfall event is a major contributor to baby leaf crops growing too fast and becoming too soft. Purdon explained that produce just won't have the shelf-life consumers expect. "It gets so wet, then you have to compensate with extra fertiliser, and because of the moisture and fertiliser, and potentially hot weather, everything is going to grow; but it's half drowned, it grows too fast, and it's weak, and now you have a shelf-life problem," he said.

Weak crops have a reduced shelf-life and can see rejections from supermarkets and wholesalers. Chadwick described how looks can be deceiving following a significant rain event. "Even something that looks half decent in the field potentially has no shelf-life whatsoever... and that's the part people don't understand," he said. Chadwick also explained that in a perfect world, crops would have moisture levels reduced prior to harvest to toughen up the crop for processing and shelf-life.

Longer term losses

Crop health is just one reason why there might be supply shortages weeks after a rain event. The other key reason is something growers refer to as a 'planting gap'. Just as harvest, spray and fertiliser machinery are impacted by the wet and muddy conditions directly after a rain event, so too is the machinery used to plant new crops. Purdon explained that in a normal week, planting may occur two or three times; so, if just one planting is missed, then there will be a significant gap in supply. "The market four to six weeks after a rain event is going to be impacted by a shortage, because of the crops that couldn't be planted in the wet. There's a planting gap," he said. "Planting infrequency and gaps have a major impact on future supply."

"It's been put underwater straight away, it's just going to rot and die."

-Walter Chadwick

Chadwick described the potential impacts to newly planted crops that would have been scheduled for harvest four to six weeks after a rain event. "There are already percentages lost, even in crops that have just germinated. Because it's been put underwater straight away, it's just going to rot and die; it can't live, it's suffocated. It can't grow, that's it," he said. This contributes to an extended planting gap, where farms potentially have no produce to supply to supermarkets or wholesalers weeks after a rain event and even longer during a compound event.

In an attempt to 'rescue' crops following a rain event, farms will put double the fertiliser and double the spray onto crops to prevent disease and fungus, and to minimise the amount of produce that turns yellow. Purdon stressed that all these extra inputs come at great expense and with no guarantee of a return. "It's a gamble, you run the risk of putting a lot more money into the crop and still getting nothing; but if you don't do it, you definitely get nothing," he said. The risks associated with farming emerged as a common theme, with Chadwick also noting that: "gambling with the current cost of fertiliser is a big gamble."

Conclusions

Both farm managers highlighted the 'cost of perfection' in the baby leaf industry. "Everything has to be picture perfect," said Chadwick. "A crop can look fine, except the colour is too pale; [we are] constantly chasing that nice luscious dark green colour that consumers want."

"Everything has to be picture perfect."

-Walter Chadwick

Ben Gebert, CEO at Food & Fibre Gippsland has extensive experience across the sector and notes consumers' and markets' high-quality expectations when it comes to fresh produce. "The marketers' fixation with 'perfection', and consumer demands for longer shelf-lives and higher uniformity are often at odds with the realities of growing fresh produce – particularly when our growing regions are experiencing climate volatility," he said.

The baby leaf industry can be a ruthless one, with wholesalers and supermarkets dropping farms for weeks



Root decay in spinach and rocket (insert).

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at a time when supply or quality are uncontrollably impacted by rain events. This can significantly impact a grower's market share and reputation for weeks to come, even after supply volumes and quality have returned. Purdon explained that there are long-term costs associated with trying to meet the high standards of Australia's baby leaf industry and emphasised the need for balance. "You're trying to do the right thing by the customer, but the cost of perfection can come at the cost of your soils," he said. "Soil is a living organism; if you don't treat it right, you can drown it, you can damage it in multiple ways."

"Prolonged waterlogging poses a serious threat to the health of the soil."

-Noel Jansz

Noel Jansz, Branch Manager and Agronomist at Elders Bairnsdale, has extensive experience working with numerous baby leaf farms across Gippsland. He emphasised the long-term impacts that can arise from extended waterlogging in soil. According to Jansz: "Prolonged waterlogging poses a serious threat to the health of the soil and, consequently, the overall productivity of a farm."

He explained that when soil remains waterlogged for extended periods, it leads to a decrease in oxygen levels in

the soil profile and in the long run, the structural integrity of the soil may become compromised. "Prolonged waterlogging can lead to soil compaction and the breakdown of soil aggregates, negatively impacting its porosity and drainage capabilities," he said. "This, in turn, exacerbates the risk of future waterlogging events and creates a vicious cycle of deteriorating soil health."

Next steps

If ongoing weather forecasts are anything to go by, baby leaf growers aren't getting a reprieve from these devastating impacts any time soon. So, while they battle with increasing stress levels, fight daily for their market share, and continue to gamble everything for perfection, what does the customer need to know?

All levels of customer need to be educated and informed about affected crops and the impacts of severe, prolonged, and compound rain events; while at the same time, supporting growers in buying baby leaf salad understanding that the shelf life on some products may not be as good as they might expect.

How to do this?

Well, that's another question entirely.

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With special thanks to Walter Chadwick, Warrick Purdon, Noel Jansz & Ben Gebert.



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