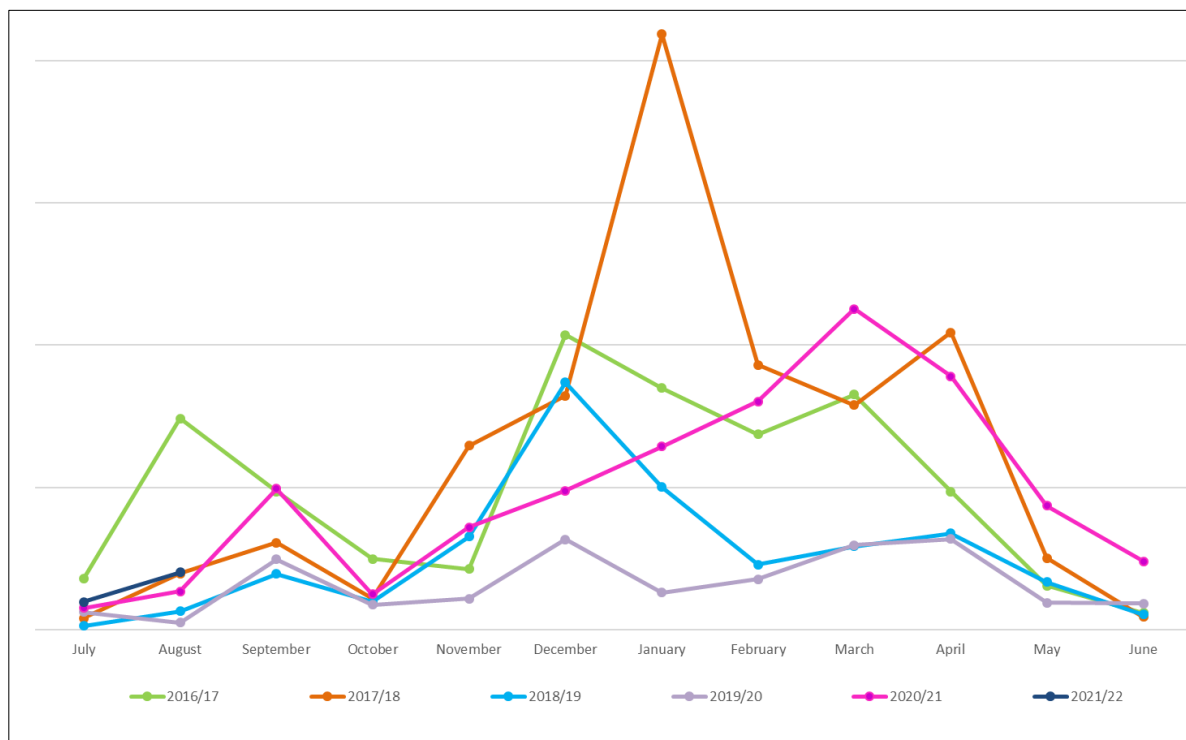


## 2020/21 season summary

The year 2020/21 was a bad one for Queensland fruit fly (Qfly) in the Greater Sunraysia Pest Free Area (GSPFA). In fact, 2020/21 was a bad year for pest fruit flies throughout most of south-eastern Australia.

Pest fruit fly incursions and their proliferation were promoted by the presence of benign weather conditions consistent with the La Niña event, with more rainfall, higher winter daily minimum temperatures and lower summer maximum temperatures. During this period, some of the 2021 harvest was also not picked and was left on the ground or on the tree/vine due to the lack of pickers resulting from COVID-19 restrictions.

The year saw a particularly high number of Qfly outbreaks in southern and western NSW, Victoria, South Australia and Western Australia. Basically, most regions of south-eastern Australia experienced an increase in the number of pest fruit flies on their fruit fly trapping grids. This includes the GSPFA, which recorded its highest numbers since 2017/18 (Figure 1).



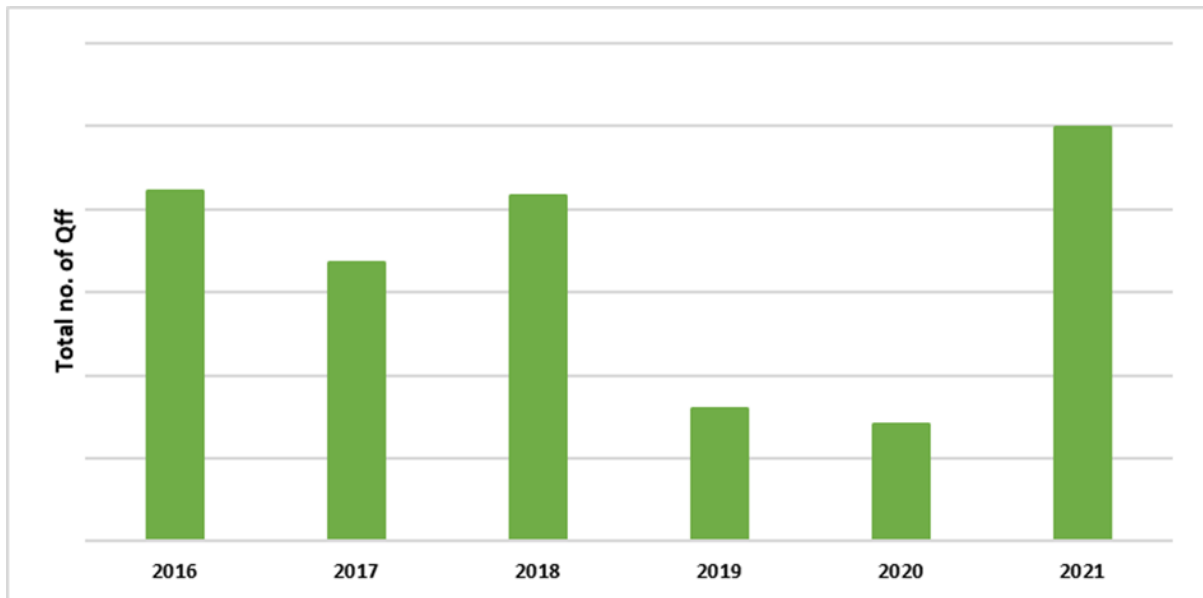
**Figure 1:** Qfly detections in the greater Sunraysia production area from 2015/16 to 2018/19.

\*July and August 2021 surveillance has been impacted by COVID-19 lockdown restrictions in NSW and Victoria.

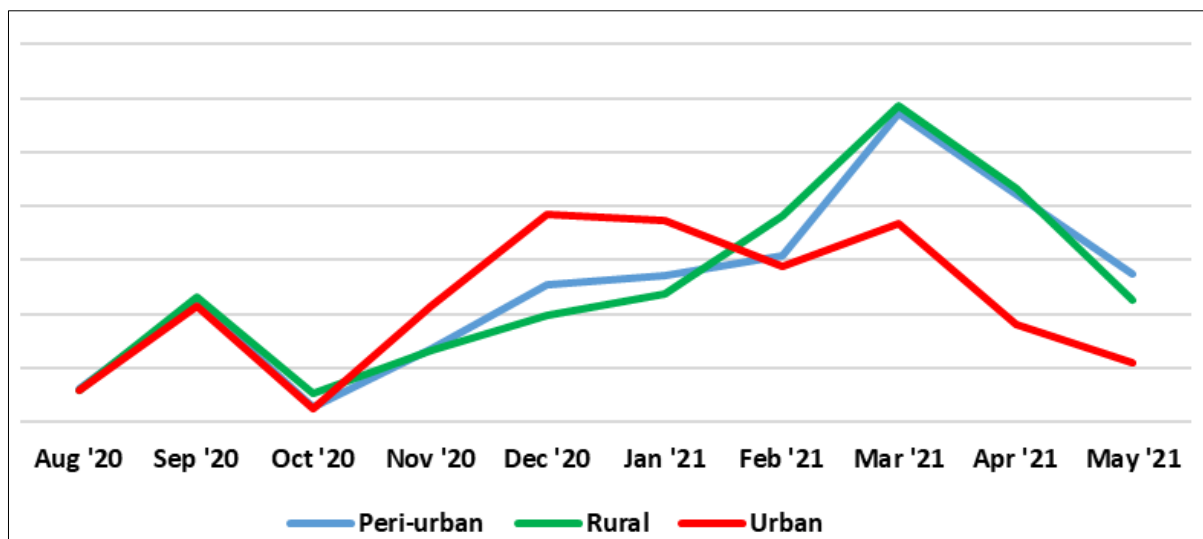
During November, eggs, larvae and pupae produced by flies that survived the previous winter started to emerge as adult flies on the wing. Qfly populations started to expand rapidly as the weather was warm but not hot (especially at night) and relatively moist, with more than normal monthly rainfalls occurring in August, October 2020 and January 2021 – fairly typical of the La Niña weather pattern that commenced in south-eastern Australia in March 2020. These rains coincided with times when both Qfly populations and the number of ripening Qfly host fruits were expanding.

As a result of La Niña and higher volumes of unharvested fruit in commercial production areas, high numbers of Qfly were trapped in the GSPFA during autumn 2021 – the highest for the last six years (Figure 2). The suggestion that the prevalence of unharvested fruit in the region was involved in extra Qfly problems is borne out by trapping data showing the presence of high Qfly populations in peri-

urban and rural locations compared with urban areas during autumn when commercial fruit is usually harvested (Figure 3).



**Figure 2:** Total number of Qfly trapped in the GSPFA in autumn (March, April and May) each year for six years.



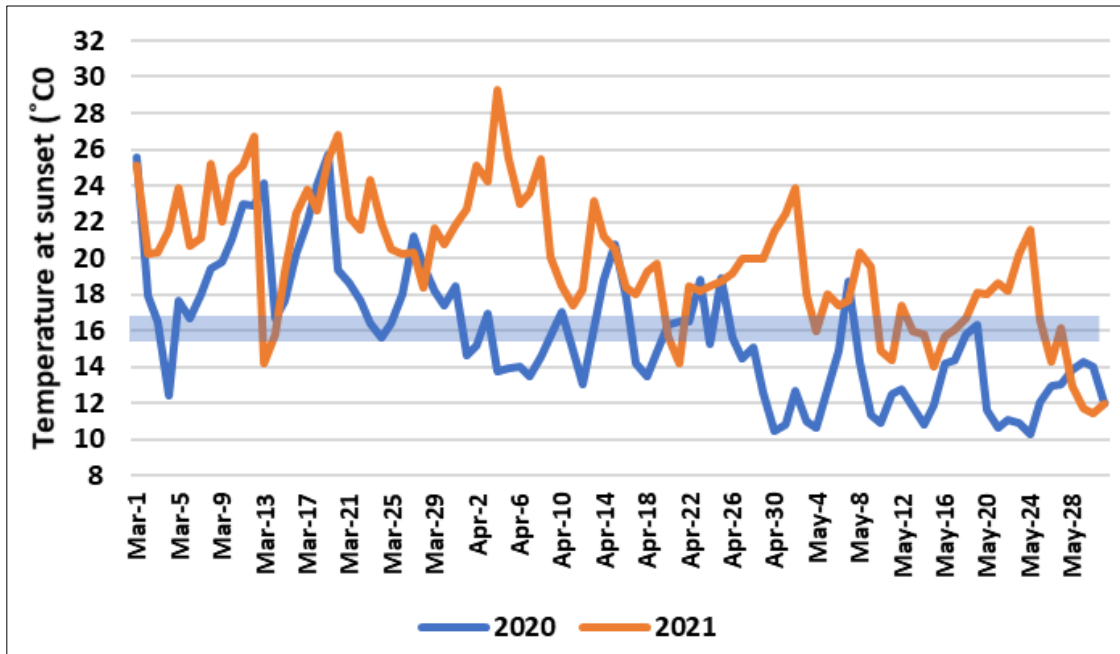
**Figure 3:** Qfly population size across different land use locations from August 2020 to May 2021.

Weather plays an important part in the number of fruit varieties available for fruit flies to infest in September and October and how many fruit flies survive winter. Warm, moist winter weather encourages the survival, growth and spread of Qfly. This occurred during autumn 2021 as can be seen by the increased numbers of Qfly trapped (Figure 2 and 3).

### Winter fly behaviour

In 2021, an extended autumn (Figure 4) allowed Qfly to fly, mate and lay eggs further into the end of the fruit fly season than usual. In seasons with normal temperatures, Qfly eggs laid prior to about mid-April would not survive the late autumn and winter. However, higher temperatures in April and May 2021 created conditions favouring mating and egg-laying so that the cut-off point was extended by a month or so.

There may have been a larger population of adult flies able to find refuge in warm spots in the GSPFA and survive winter to then cause havoc in the spring and following fruiting seasons.



**Figure 4:** Comparison of sunset temperatures in Mildura during the autumn of 2020 and 2021. Qfly will mate when the temperature at sunset is greater than 16°C.

Every year in late August or early September, Qfly leave their winter refuge looking for protein, needed for egg and sperm production, and carbohydrates for energy to fly, mate and lay eggs. Over the following year, Qfly numbers peak in September then drop off in October and November when adults die out, leaving large numbers of unseen immature life stages (i.e. eggs and larvae in fruit and pupae in the ground beneath infested fruiting plants).

From December to about April, several overlapping Qfly populations develop and lay their eggs into any ripening or ripe fruit within one or two kilometres. Even if a female mates only once, she could lay up to 2,000 eggs in her lifetime, choosing which fruit to infest, how many eggs and when she lays into it. She could live for four to six weeks in warm weather, or four months or more in cool weather. Her 2,000 eggs could produce up to 800 fertile adult Qfly (of which 400 will be female). In one generation (about 22 days in warm weather), two Qfly (i.e. one male and one female in a single mating event) could produce  $400 \times 2000 = 800,000$  eggs and 400 fertile adult females. The second generation from that one mating event could result in 320,000,000 eggs and 160,000 females. Any ripening or ripe fruit within 1–2km of these flies would be destroyed.

*This information was compiled by Andrew Jessup of Janren Consulting for the September 2021 Greater Sunraysia Pest Free Area grower newsletter.*