

Lettuce necrotic yellows virus in the Lockyer Valley

Background

Necrotic yellows is a common and, at times, a very damaging disease of lettuce throughout Australia. Severe outbreaks of the disease have recently occurred in lettuce crops in south Queensland during autumn-winter 2020.

The weed Sowthistle (*Sonchus oleraceus*) is the major host of both *lettuce necrotic yellows virus* (LNYV) and the Sowthistle aphid (*Hyperomyzus lactucae*), which is the insect vector responsible for spread of the virus into lettuce crops. Sowthistle infected with LNYV will show no disease symptoms.



Lettuce showing symptoms of stunting, flattening and yellowing caused by LNYV infection



Prickly lettuce

Sowthistle aphids do not colonise or breed on lettuce and cannot obtain the virus from infected lettuce plants. Instead most virus spread is from the aphids moving into crops from infected sowthistle or potentially other weed hosts of LNYV. This could include prickly lettuce (*Lactuca serriola*) or London rocket (*Sisymbrium irio*)

Outbreaks of LNYV are generally sporadic within and between seasons with high disease levels influenced strongly by sowthistle

aphid populations either building up locally on sowthistle weed or moving through an area from further away. Disease levels in subsequent crops may then be very low as aphid populations diminish.



London rocket

London rocket weed was recently identified in the Lockyer Valley as a host of LNYV. The importance of this weed in the disease cycle of LNYV in the district is yet to be determined. The London rocket plants infected with LNYV had no disease symptoms.



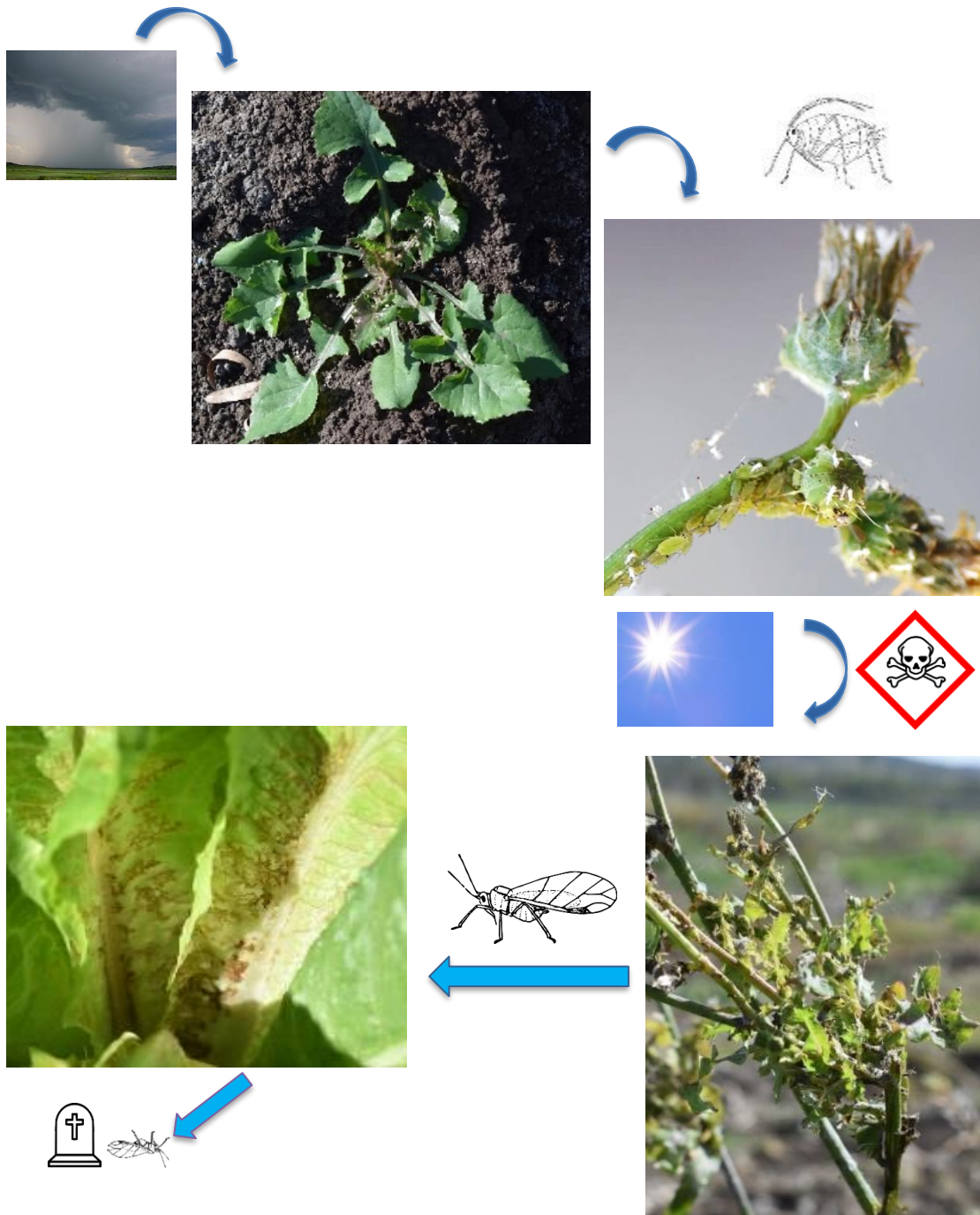
Sowthistle

Management of LNYV is mostly centred around control of the weed hosts, particularly sowthistle, and aphid populations. There are no lettuce varieties with resistance or tolerance to LNYV and insecticides applied to lettuce are unlikely to be effective given sowthistle aphid has very limited feeding on lettuce.

Control of sowthistle weed prior to crop production and continued during the season is highly recommended. Germination of sowthistle seed is more dependent on soil moisture than temperature, with most seeds germinating when soil moisture is close to field capacity. Periods of extended rain will trigger this germination and continued moisture will promote weed growth and flowering. Controlling the weed prior to flower stalk formation is the best option for aphid control. The sowthistle aphid breeds on these flower stalks and when conditions dry or herbicide is applied to weeds the aphids will move off into the lettuce crops, spreading LNYV into the crops.

Further information on the management of sowthistle weed is available through this previously published factsheet (https://www.daf.qld.gov.au/data/assets/pdf_file/0004/75640/Management-of-common-sowthistle.pdf).

Lettuce necrotic yellows virus disease cycle



Lettuce necrotic yellows virus (LNYV) disease cycle in the Lockyer Valley. Late summer and/or autumn rainfall stimulates weed seeds such as sowthistle to germinate and with continued moisture and cool temperatures the weeds grow and flower. Formation of flower stalks are attractive to the sowthistle aphid which then colonises the weed. Once aphid numbers become high and/or the weed starts to die off due to drier weather or herbicide applications, the winged adult aphids will move off in search of another plant. In the absence of other weeds to move onto they will move into crops such as lettuce. The sowthistle aphid does not feed well on lettuce but does feed long enough to infect the plant with LNYV and will eventually die if unable to find an alternative plant to feed on.

Disease symptoms

Young lettuce plants may show leaf chlorosis and stunting. In mature plants, initial symptoms are browning of leaf veins followed by partial death of the inner leaves. Infected plants are yellow and stunted, often with twisted and lopsided leaves. In advanced stages, the outer leaves wilt severely, giving the plant a flattened, stunted appearance. Mature lettuce heads often show internal necrosis symptoms and cannot be marketed.



Lettuce showing symptoms of browning of leaf veins (LHS) and leaf death and plant distortion (RHS) caused by LNYV infection

The symptoms of necrotic yellows are similar to those caused by other viruses infecting lettuce, including tomato spotted wilt virus (spread by thrips) and turnip mosaic virus (spread by Green peach aphid). Laboratory tests are needed for accurate identification of the virus or viruses present which will assist in applying management strategies.

Further information

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