

# Currant Lettuce Aphid

*Nasonovia ribisnigri* (Nr:0 & Nr:1)



***Nasonovia ribisnigri* (Nr), also known as the Currant-Lettuce Aphid, is an important pest for lettuce and endive crops, and is widespread in Australia.**

**First discovered in Australia in 2004, Nr:0 rapidly spread throughout the country. Use of Nr:0 resistant lettuce varieties is commonplace.**

**In 2007 a new resistance-breaking biotype was discovered in Europe. This new biotype is called 'Nr:1', to distinguish it from the main biotype, 'Nr:0'.**

**The Nr:1 biotype was confirmed in Australia (Victoria) in late 2017.**

## General information

Nr is proven to be active between 8°C and 28°C, with an optimal range between 20°C and 26°C. At 26°C development time is only 6 - 7 days.

At its most active Nr adults can produce up to five offspring per day, and populations can double in a period of 3 - 4 days.

This aphid species infests the innermost leaves and folds in leaves of a young plant and the heart of more mature lettuces, making it nearly impossible to eradicate with foliar aphicides applications once the lettuce has hearted.

Infestation causes some stunting of the lettuce due to feeding activity, although unmarketability of the crop is often largely due to soiling (aphids inside the head of lettuce).

## Evolution of a new biotype

Aphids have a short life cycle and high reproduction rate. This increases the probability for natural mutation to occur and result in the evolution of a new biotype. The ability of aphids to evolve new biotypes is well documented.

Growers will be familiar with lettuce downy mildew as an example of resistance-breaking biotypes developing independently in locations across the globe.

Nr:1 was first identified in Western Europe in 2007. In December 2017 a case of Nr:1 was confirmed in Australia.

Nr:1 overcomes the Nr:0 resistance gene that has been in effect since 1997. This gene is common to all commercial lettuce varieties with Nr:0 resistance.

Even with the confirmation of Nr:1 in Australia, it is important to note that Nr:0 is still present either in mixed populations or in areas that



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The pictures in this catalogue show the types to which the varieties as mentioned belong and not all varieties as such. These pictures do not constitute any warranty, express or implied, of crop performance.

## Sharing a healthy future

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Nr:1 has not reached. As such Nr:0 is still a major pest in Australian lettuce crops and therefore varietal resistance remains a vital part in managing Nr populations.

Rijk Zwaan advocates an integrated pest management approach that uses varietal resistance, cultural techniques and chemical intervention as the three pillars that will work best in helping to control Nr:0 and limit the spread of Nr:1.

### Host range

- Cultivated lettuce and wild relatives (Lactuca spp.)
- Endive and chicory (Cichorium spp.)
- Blackcurrant (ribes nigrum) and relatives
- some herbaceous species (hawksbeard, hawkweed, Nipplewort, Eyewort)
- Some flowering species (Petunia, Veronica)

### History

- 1978: Resistance to Nasonovia found in Lactuca virosa
- 1979: Crosses with cultivated lettuce by Wageningen University
- 1981: Material taken over by Dutch breeders
- 1995: Problem solved with dwarf plants
- 1997: Introduction of first resistant varieties
- 2007: Discovery of Nr:1 in Europe
- 2017: Confirmation of Nr:1 in Australia

### Control

Control of Nr is best achieved by an integrated approach to pest management:

- Varietal resistance to Nr:0.
- Cultural techniques (crop rotation, planting schedules and patterns, crop hygiene and general crop husbandry).
- Use of appropriate chemical controls when necessary.

### Monitoring

Regular monitoring of the lettuce crop is crucial for early detection of infestation. Monitoring should occur preferably twice a week, and should cover all varieties (including those resistant to Nr:0).

In lettuce seedlings and pre-heart lettuce, attention needs to be paid to the innermost leaves and in leaf folds, where the aphid prefers to live. Once the lettuce has hearted some destructive sampling is necessary.

Since Nr may occur non-uniformly across paddocks, samples should be made across a number of widely dispersed locations in the crop.

### IPM

Nr is active at relatively low temperatures. At these low temperatures, beneficials included in any IPM strategy might not be around and/or able to keep up with the population growth in the aphids.

### Drenching

Growers should drench seedlings to control Nr, however the active components present in most seedling drenches can negatively impact IPM.

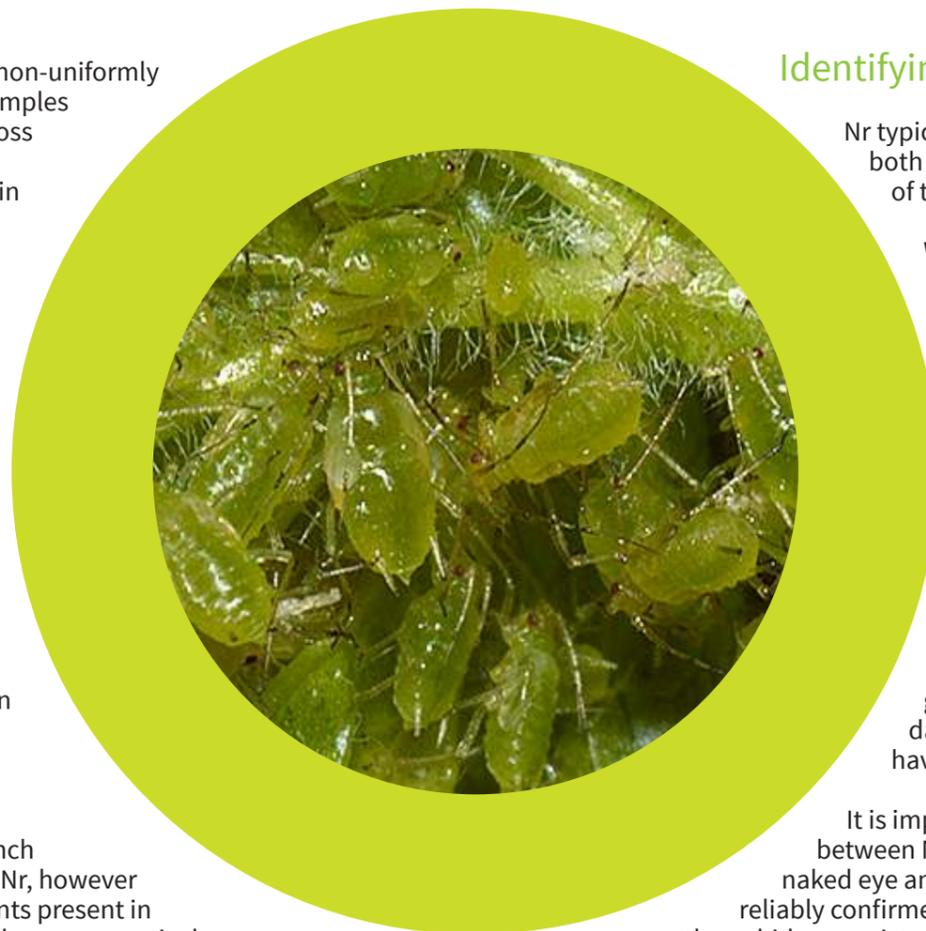
### Spray

If chemical control is considered it is important to treat crops early when the aphid colonisation reaches a threshold of 1 to 5 percent, using effective pesticide rates to control that population.

There are various options available to growers for chemical treatment including:

- Contact insecticides and aphicides, which need to fall onto the aphid and are only effective up until the lettuce forms a heart.
- Systemic insecticides and aphicides, which are taken up and distributed within the plant and can kill aphids inside the heart of the lettuce.
- It should be noted that treatment with a systemic control after head formation can be effective in stopping the spread of aphid, but if infestation levels are high dead aphids in the heart of the lettuce can affect the marketable value of the crop.

**For more information on chemical control of Nr please speak with your local agronomist or chemical supplier as registrations and permits can vary from state to state.**



### Identifying Nr

Nr typically has long antennae in both adult and immature stages of the life cycle.

Wingless forms of the aphid have a shiny body, and are typically green to yellow-green (although colour can range from a reddish colour through to yellow-green and to green).

Adults are 2.5mm in length and have regular narrow dark bands on their abdomen.

Winged adults have a greenish abdomen with a dark head and thorax, and have dark siphunculi.

It is impossible to distinguish between Nr:0 and Nr:1 using the naked eye and identification can only be reliably confirmed by a bio-assay (growing the aphids on resistant lettuce).



Source: www.influentialpoints.com



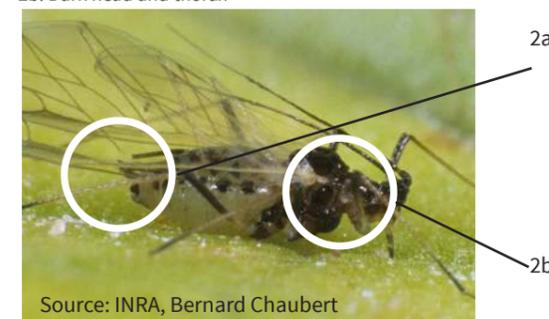
Source: www.influentialpoints.com

Nr wingless forms exhibiting a range of colours and intensity of dark bands on abdomen



Source: www.belchim.co.uk

- 1a. Long antennae
- 1b. Narrow dark bands on abdomen on an adult
- 2a. Dark siphunculi on greenish thorax
- 2b. Dark head and thorax



Source: INRA, Bernard Chaubert



Source: Koppert Biological Systems



Source: Whitney Cranshaw, Colorado State University