

# Lettuce information kit

Reprint – information current in 1997



## REPRINT INFORMATION – PLEASE READ!

For updated information please call 13 25 23 or visit the website [www.deedi.qld.gov.au](http://www.deedi.qld.gov.au)

This publication has been reprinted as a digital book without any changes to the content published in 1997. We advise readers to take particular note of the areas most likely to be out-of-date and so requiring further research:

- Chemical recommendations—check with an agronomist or Infopest [www.infopest.qld.gov.au](http://www.infopest.qld.gov.au)
- Financial information—costs and returns listed in this publication are out of date. Please contact an adviser or industry body to assist with identifying more current figures.
- Varieties—new varieties are likely to be available and some older varieties may no longer be recommended. Check with an agronomist, call the Business Information Centre on 13 25 23, visit our website [www.deedi.qld.gov.au](http://www.deedi.qld.gov.au) or contact the industry body.
- Contacts—many of the contact details may have changed and there could be several new contacts available. The industry organisation may be able to assist you to find the information or services you require.
- Organisation names—most government agencies referred to in this publication have had name changes. Contact the Business Information Centre on 13 25 23 or the industry organisation to find out the current name and contact details for these agencies.
- Additional information—many other sources of information are now available for each crop. Contact an agronomist, Business Information Centre on 13 25 23 or the industry organisation for other suggested reading.

Even with these limitations we believe this information kit provides important and valuable information for intending and existing growers.

**This publication was last revised in 1997. The information is not current and the accuracy of the information cannot be guaranteed by the State of Queensland.**

This information has been made available to assist users to identify issues involved in lettuce production. This information is not to be used or relied upon by users for any purpose which may expose the user or any other person to loss or damage. Users should conduct their own inquiries and rely on their own independent professional advice.

While every care has been taken in preparing this publication, the State of Queensland accepts no responsibility for decisions or actions taken as a result of any data, information, statement or advice, expressed or implied, contained in this publication.



Queensland Government



# Problem **SOLVER**

*Every crop will inevitably have a problem or two. The key to dealing with problems is prompt identification and, where appropriate, prompt treatment. This section helps you with both these decisions. The common problems are shown in a series of pictures, grouped according to the main symptom. From the contents, find the symptom that best fits your problem. On that page you will find the causes and the solution, if there is one.*

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## Seedlings dead, missing or growing poorly



### 1. New plants die or grow poorly

**Cause.** Poor transplant establishment. There are several causes which include soil diseases such as black root rot or damping-off, water stress, hot conditions at planting out, cold conditions or frost, herbicide damage or careless transplanting.

**Solution.** Make sure all organic matter is completely decomposed before planting. Practice crop rotation. Do not double crop lettuce — that is, do not plant immediately after a previous lettuce crop. Plant early in the day and irrigate immediately after planting. Pay close attention to watering after transplanting.



### 2. Seedlings chewed or missing

Upper: seedling chewed off by cutworm. Lower: cutworm larvae.

**Cause.** Insects such as cutworm *Agrotis* spp. or earwigs *Nala livipes*. Hares, wallabies, kangaroos and ducks can occasionally cause significant damage.

**Solution.** Check for cutworms in the soil near affected plants. Spray with an appropriate chemical from the *Problem solver handy guide* if cutworms are found. If hares are a problem, electric fencing or netting can keep them out. You can shoot hares legally if you have a firearms licence.

If native animals are a problem, netting or an electric fence around the perimeter of the planting may help. Scare guns, suspended hawk kites and other scarecrow type devices or audio devices are another option. If you have problems with protected native birds and mammals contact your nearest office of the Department of Environment. The department will issue a Damage Mitigation Permit only if you can demonstrate that you have tried other methods



## Spots or marks on leaves



of managing the pest.

### 3. Dry leaf spot

**Cause.** The bacterium *Xanthomonas campestris* pv. *vitians*. It is seed-borne and favoured by cool, showery weather when it is spread by wind-blown water droplets and water splash.

**Solution.** Avoid planting Salinas-Vanguard varieties in cool, rainy seasons. Consult your seed/seedling supplier and grow resistant or tolerant varieties. Spray with an appropriate copper fungicide from the *Problem solver handy guide*.



### 4. Downy mildew

Advanced downy mildew. Inset shows close-up of mildew.

**Cause.** The fungus *Bremia lactucae*. In moist weather, a white downy fungal growth develops on the underside of the leaf. It is mainly spread by wind from older lettuce crops, but can survive in the soil. Worse on lower, shaded leaves which stay moist.

**Solution.** Plant resistant varieties. Plough in old crops as soon as harvesting is completed. Spray with an appropriate chemical from the *Problem solver handy guide*. If the disease is well advanced, it will be difficult to control. Refer to Section 4 *Key issues* for details on management of downy mildew.

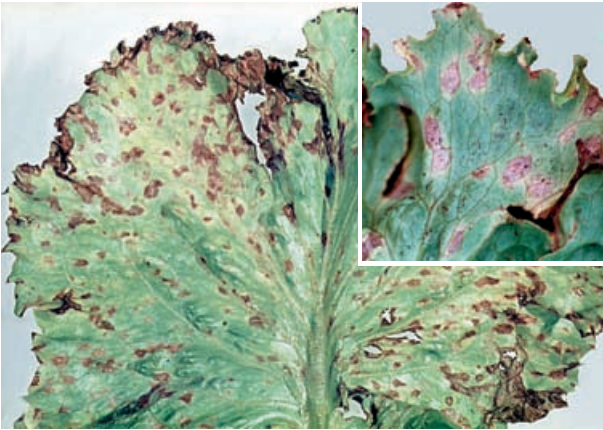


### 5. Spotted wilt

**Cause.** Tomato spotted wilt virus. Spread by thrips, from infected weeds, ornamentals or vegetables. More common in spring and early summer in cooler areas.

**Solution.** Control weeds in and around lettuce crops.

## Spots or marks on leaves



### 6. Septoria spot

Inset shows close-up of infected leaf.

**Cause.** The fungus *Septoria lactucae*. It survives on crop residues and weed hosts. Spores are spread in wet, windy weather.

**Solution.** Do not plant lettuce in areas with undecomposed crop residues. Practice crop rotation. Destroy crops immediately after harvest. Spray with an appropriate chemical from the *Problem solver handy guide*.

## Yellow or brown leaf edges



### 7. Dry leaf spot

Upper: general spotting. Lower: infection of the leaf margins.

**Cause.** The bacterium *Xanthomonas campestris* pv. *vitians*. It is seed-borne and favoured by cool, showery weather when it is spread by wind-blown water droplets and water splash.

**Solution.** Avoid planting Salinas-Vanguard varieties in cool, rainy seasons. Consult your seed/seedling supplier and grow resistant or tolerant varieties. Spray with an appropriate copper fungicide from the *Problem solver handy guide*.

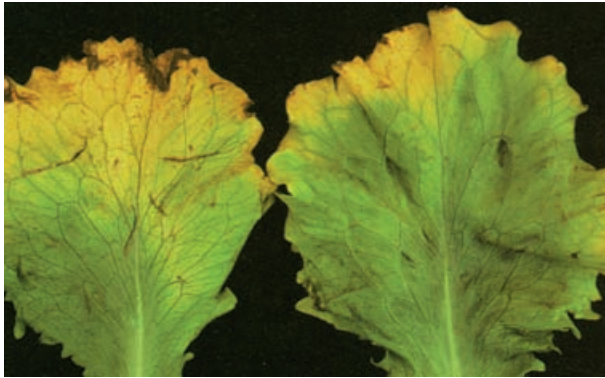


### 8. Spotted wilt

**Cause.** Tomato spotted wilt virus. Spread by thrips, from infected weeds, ornamentals or vegetables, for example lettuce or tomatoes. More common in spring and early summer in cooler areas.

**Solution.** Control weeds in and around lettuce crops.

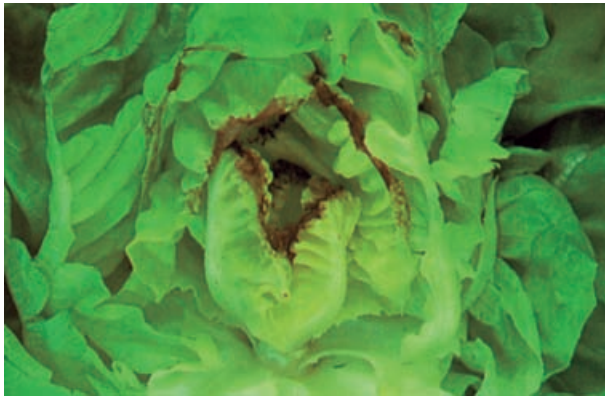
## Yellow or brown leaf edges



### 9. Chloride or sodium toxicity

**Cause.** High concentrations of salt (sodium chloride) in soil or irrigation water. Similar symptoms can be caused by water stress, potassium deficiency or fertiliser burn.

**Solution.** Test the quality of irrigation water. Use the least saline available.



### 10. Tipburn

**Cause.** Calcium deficiency in growing tissues. Related to periods of rapid growth, warm weather and water stress.

**Solution.** Improve water management. Plant the right variety for the season. Do a soil test before planting the next crop. Apply calcium if needed. Weekly foliar applications of calcium nitrate at 800 g/100 L of water may help.



### 11. Lettuce necrotic yellows

**Cause.** The lettuce necrotic yellows virus. Affected plants are stunted, with twisted leaves. Spread by the sowthistle aphid *Hyperomyzus lactucae* from the common sowthistle.

**Solution.** Destroy sowthistle weeds in and around the crop. Spray to control aphids with an appropriate chemical from the *Problem solver handy guide*.

## Holes in leaves



### 12. Heliothis (budworm) grub

Left: note holes in leaves. Right: grub and discoloured feeding damage.

**Cause.** Larvae of the moths *Helicoverpa armigera* and *H. punctigera*. Heliothis is a major pest of lettuce. Grubs also feed on the internal leaves of the head.

**Solution.** Check the crop regularly for signs of the pest and spray as required. Time sprays to target newly hatched grubs before they burrow into the plant's centre. Spray with an appropriate chemical from the *Problem solver handy guide*.

## Pale or mottled leaves



### 13. Mosaic

Left: affected leaf showing light green mottling and vein clearing. Right: healthy leaf.

**Cause.** The lettuce mosaic virus. Both seed-borne and spread by aphids, mostly from older lettuce crops but also from weeds. Infected plants are also stunted.

**Solution.** Use seed which has been tested free of the virus. Check with the seed/seedling supplier. Destroy old lettuce crops as soon as harvesting is completed.



### 14. Lettuce necrotic yellows

**Cause.** The lettuce necrotic yellows virus. Affected plants are stunted, with twisted leaves. Spread by the sowthistle aphid *Hyperomyzus lactucae* from the common sowthistle.

**Solution.** Destroy sowthistle weeds in and around the crop. Spray to control aphids with an appropriate chemical from the *Problem solver handy guide*.



### 15. Lettuce big vein

Left: affected leaf showing enlarged, transparent veins. Right: healthy leaf.

**Cause.** The lettuce big vein virus. Spread by a soil-dwelling fungus *Olpidium brassicae* which infects the roots and transmits the virus. Common in soils that stay moist and are in poorly drained areas. It survives in the soil for long periods and is more common in cool weather.

**Solution.** Enquire about resistant varieties from seed companies. Improved drainage in heavier soil may help reduce disease incidence.



### 16. Downy mildew

Left: note white downy growth on underside of leaf. Right: upper side of leaf.

**Cause.** The fungus *Bremia lactucae*. In moist weather, a white downy fungal growth develops on the underside of the leaf. Spots turn brown and dead areas develop. Downy mildew is mainly spread by wind from older lettuce crops, but it can survive in the soil. Worse on lower, shaded leaves which stay moist.

**Solution.** Plant resistant varieties. Plough in old crops as soon as harvesting is completed. Spray with an appropriate chemical from the *Problem solver handy guide*. If the disease is well advanced it will be difficult to control. Section 4 has details on management of downy mildew.

## Yellow or brown outer leaves



### 17. Lettuce necrotic yellows

Left: normal sized plant. Right: affected plant.

**Cause.** The lettuce necrotic yellows virus. Affected plants are stunted, with twisted leaves. Spread by the sowthistle aphid *Hyperomyzus lactucae* from the common sowthistle.

**Solution.** Destroy sowthistle weeds in and around the crop. Spray to control aphids with an appropriate chemical from the *Problem solver handy guide*.



### 18. Sclerotinia rot (drop)

**Cause.** The fungi *Sclerotinia sclerotiorum* and *S. minor*. A soft watery rot develops at ground level and moves into the head. Worse in cool moist weather.

**Solution.** In cooler months avoid planting into infected fields. Avoid planting in wet, shaded areas. As soon as harvesting is completed, destroy crop residues by deep cultivation. Spray with an appropriate chemical from the *Problem solver handy guide*.



### 19. Chlorine toxicity

**Cause.** Poor quality irrigation water. Outside leaves are yellow with necrosis (dying) of leaf margins.

**Solution.** Test the quality of irrigation water. Use the least saline available.



### 20. Spotted wilt

**Cause.** Tomato spotted wilt virus. Spread by thrips, from infected weeds, ornamentals or vegetables. More common in spring and early summer in cooler areas.

**Solution.** Control weeds in and around lettuce crops.

The top photo shows typical symptoms of stunted plants.