



Pacific Pests, Pathogens & Weeds - Fact Sheets

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Tomato big bud (212)



Photo 1. Upward curling of leaves, and erect nature of branches on tomato caused by big bud, *Candidatus* Phytoplasma aurantifolia.



Photo 2. Tomato infected with big bud, *Candidatus* Phytoplasma aurantifolia, showing short, thick stems and deformed leaves.



Photo 3. Mass of leaves stimulated to form after infection by *Candidatus* Phytoplasma aurantifolia.



Photo 4. Erect shoots and bushy tomatoes infected by big bud, *Candidatus* Phytoplasma aurantifolia.

Common Name

Tomato big bud

Scientific Name

Candidatus Phytoplasma aurantifolia; there are several strains of the phytoplasma identified in tomato throughout the world; the strain in the Pacific is in the phytoplasma group/subgroup coded 16SrII. This code refers to analysis of ribosomal RNA.

Distribution

Uncertain. There are many other countries where tomato big bud has been reported, for instance, China, India, and other Asian countries, South Africa, and the USA, but the strains have not been reported. Tomato big bud (16SrII) was first recorded in Australia. It is reported from many Pacific Islands countries in many different plants, but only in New Caledonia from tomato. Big bud of unknown phytoplasma strain has also been recorded in tomato from Fiji.

Hosts

Many cultivated plants (crops and ornamentals) and weeds are reported to be infected by the strain (16SrII) that is found in tomato, for instance, beach morning glory (*Ipomoea pes-caprae* subsp. *basiliensis*), Chinese cabbage, peanut, sweetpotato, and the weeds/ornamentals, *Achyranthes*, *Celosia*, *Crotalaria*, *Cyanthillium*, *Emilia*, and *Polygala*.

Symptoms & Life Cycle

Leaves are small, curled upwards and yellowish-green or purple (Photo 1). Stems become erect, short, thick and purple (Photo2); flower buds become swollen, with green petals - hence the name of the disease - and normally dormant buds develop shoots. Green fruits are hard, tough and woody.

Plants infected early are bushy, because of the development of many branches (Photos 3&4).

Spread of the phytoplasma is by leafhoppers. One leafhopper that spreads tomato big bud is *Orosius argentatus*, but it is possible that there are other species. This leafhopper lives and breeds on weeds, and moves to tomato (and other crops) during dry times. Spread can be over long distances, during leafhopper migrations. There is very little spread of the phytoplasma within crops of tomato.

The phytoplasma survives in weeds, and in the bodies of the leafhoppers. Once leafhoppers become infected by feeding on a plant with phytoplasma, they remain infected for life.

Impact

Big bud is usually a minor disease on tomato. The usual situation is that only a few plants of a crop are infected and show symptoms, although instances are reported (but not from the Pacific islands) where 30-40% of plants were infected, and yields were low because fruits were absent or very small.

Detection & inspection

Look for the upward curled leaves, erect stems, and short thick shoots, with deformed leaves. Look for the swollen flowers, with green petals.

Management

CULTURAL CONTROL

There are few ways to control phytoplasma diseases; if the damage is severe, it might be best to replant than suffer low yields.

Before planting:

- Remove any "volunteer" tomato plants and weeds, especially those in the tomato family, from around nurseries and in and around field plots.
- Preferably, raise the tomato seedlings in a screenhouse or under an insect screen cover.
- Do not plant next to other susceptible crops, such as eggplant or capsicum.

After harvest:

- Collect the plants together with weeds around the planting and burn or bury them.

CHEMICAL CONTROL

The value of insecticides in the control of this disease is not clear. Insecticides that are effective against the leafhoppers, may not give control in the field. If plants are infected by migrating leafhoppers, they may infect before the insecticide kills them.

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Information from *Diseases of vegetable crops in Australia* (2010). Editors, Denis Persley, Tony Cooke, Susan House. CSIRO Publishing; and from D Blancard (2012) *Tomato diseases - Identification, Biology and Control*. Manson Publishing Ltd, London NW11 7DL, UK. Photos 2&4 Kohler F, Pellegrin F, Jackson G, McKenzie E (1997) *Diseases of cultivated crops in Pacific Island countries*. South Pacific Commission. Pirie Printers Pty Limited, Canberra, Australia. Photo 3 Sione Foliaki, Deputy Director and Head of Agricultural Research and Information Division, MAF, Tonga.

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