# POSSIBILITIES FOR EXTRAPOLATION OF EFFICACY AND PHYTOTOXICITY OF PLANT PROTECTION PRODUCTS FOR ORNAMENTAL CROPS

Version 1.3

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# PREFACE

The current extrapolation document is based on knowledge and experience gained from previous efficacy and crop safety research, based on expert judgement. It provides insight into which extrapolations are possible from specific pest/crop combinations. It is a working document that has been regularly updated between 1999 and 2014 for pests or diseases, crops and extrapolation possibilities.

In the new structure of the extrapolation document, the extrapolation possibilities are approached in a different way. For each pest or disease group, the most prevalent pests or diseases in ornamental crops are listed. The most important test organisms and test crops for efficacy have been listed with the associated extrapolation possibilities within the crop group. Wherever possible, extrapolation possibilities from other crop groups have also been specified. For phytotoxicity, the test crops and extrapolation possibilities are shown.

In version 1.0, specific pests and diseases, or groups of pests and diseases, for one of the underlying crop groups (such as fire blight in flower bulbs) were not included in the extrapolation document for ornamentals. These have been added in version 1.1.
In version 1.2 the document was updated so that crop names are now based on version 2.2 of the DTG list (June 2019).
In version 1.3 this English version is compared to the Dutch version 1.3 and discrepancies are adapted.

## Contents

# 1 GENERAL INTRODUCTION

Motivation and objective

The Geurts motion of 18 December 2014 called for 'development of a wider-meshed authorisation system for ornamental crops aimed at the great diversity in the floriculture sectors'. In a letter to the Lower House of Parliament[1] of the Netherlands, the State Secretary of the Ministry of Infrastructure and the Environment at that time (Sharon Dijksma) pledged that the Ctgb, in anticipation of European harmonisation, would consider whether the extrapolation possibilities for ornamental crops could be expanded. The Ctgb then requested the Netherlands Food and Consumer Product Safety Authority to develop a new extrapolation document. This new extrapolation document is more compatible with the layout of the DTG list and the EPPO extrapolation tables for minor uses. The advantage of the latter is that consultation with other Member States can be started with the aim of replacing the case-by-case approach that is currently used in practice with a harmonised method for the EU.

The objective is to develop a 'coarse-mesh' authorisation system for ornamental crops based on an extrapolation document.

Scope

The extrapolation possibilities for the efficacy and phytotoxicity of plant protection products for controlling nematodes, insects/mites, fungi and weeds in ornamental crops[2] have been identified. The most important test organisms and test crops for efficacy are listed for each pest or disease (or group of pests or diseases), and the corresponding extrapolation possibilities within the ornamental crops group are shown. The extrapolation possibilities from other crop groups are also shown. For phytotoxicity, the test crops and extrapolation possibilities are shown.

The document was initially drawn up for the Netherlands, but where possible the structure is the same as the existing EPPO extrapolation tables for minor uses.

In this extrapolation document no guidelines are given for the number of tests to be carried out or how the tests must be carried out. For this information, please refer to the relevant EPPO guidelines.

1 Lower House of Parliament, 2014-2015, 27 858, letter no. 323

2 Flower bulb and flower tuber crops, floriculture crops, tree nursery crops, perennial plant cultivation, flower seed cultivation, swamp and aquatic plants and plant breeding crops and seed production

# 2 READER'S GUIDE

The extrapolation tables describe the possibilities for extrapolation of efficacy and phytotoxicity for the ornamental sector. Both the extrapolation possibilities within the crop group and the use of efficacy data outside this crop group to support or replace the substantiation of the efficacy in ornamental crops are described.

A general condition for extrapolation is that it concerns the same product and a similar use of the product (dosage of active substance, method of application, application time and frequency, etc.). In addition, aspects such as the characteristics of the product (systemic or not, preventive or curative effect, specific or broad-spectrum), the cultivation method and cultivation conditions of the crops (protected versus unprotected) and soil type (in case it is known that this affects the efficacy) should be taken into consideration. Any specific conditions for extrapolation are indicated in the individual tables.

In the extrapolation tables, both the scientific name (including EPPO code) and common name are indicated as far as possible for pests, diseases and crops. In addition, in columns 3 and 4 it is indicated whether the study/extrapolation concerns protected (G, greenhouse) or unprotected culture (F, field). If no specification is stated, it concerns both protected and unprotected culture.

Efficacy

In column 1 the most important test organisms for ornamental crops are listed (the list is not exhaustive). Column 2 lists the corresponding pest or disease group. An underlined test organism is an essential test organism within the relevant group. Based on the results when used against these underlined test organisms, extrapolation is possible to the entire pest or disease group (column 2). If several underlined test organisms are listed for a pest or disease group, then research involving all the underlined test organisms is required before extrapolation to the total group is possible. If there are no underlined test organisms in the specific pest or disease group, then efficacy must be demonstrated against several of the test organisms listed in column 1 before extrapolation is possible to the entire pest or disease group (conditions are listed in column 2).

Column 3 lists the test crops for the pest or disease group that corresponds with a crop group. Depending on the pest or disease, the research must be carried out on a single crop or multiple crops. Crops separated by 'AND' must be tested in any case. If they are separated by a comma, a choice can be made between the various test crops that are listed. Based on the results in the test crops, extrapolation is possible to the entire crop group (or groups) listed in column 4.
If correctly substantiated, other test organisms and test crops can also be chosen.

Column 5 indicates which data (crop-pest or crop-disease combinations) outside the ornamental crop sector can support or replace an efficacy claim. If an asterisk (*) is placed behind the crop, this means that data in these crops can replace data from ornamental crops

| **Pest or disease** | | **Crop: within the ornamental crops group** | | **Crop: outside the groupornamental crops** |
|---|---|---|---|---|
| **1**<br>**Test organism** | **2**<br>**Pest or disease group** | **3**<br>**Test crops (Protected, Unprotected)** | **4**<br>**Extrapolation to other crops** | **5**<br>**Data from these crops can support the test crop (no data* or less data)** |

Phytotoxicity

Nematicides, fungicides, acaricides and insecticides do not require separate phytotoxicity data (for similar applications) unless there are indications of phytotoxicity in the efficacy tests or in formulation of the product. In case of such indications, separate phytotoxicity data must be submitted. Separate phytotoxicity data must always be submitted for herbicides.

Column 1 lists the critical crops within the ornamental crops group. If no phytotoxicity is observed in three different critical crops, extrapolation to the entire floriculture crops group (column 2) is possible.

Column 3 indicates which data (crops) outside the ornamental crops group can support or replace the assessment of harmful effects in ornamentals.

The crop assortment in ornamental crops is enormous. As a result, it cannot be said with certainty that if a product does not cause damage to the tested crops, there will be no damage in different crop or different cultivar of the same crop. When in doubt for ornamental crops, it is advisable to always include a warning message on the label that the operator should perform a test treatment to determine the tolerance for the plant protection product.

In general, crops in protected culture are more sensitive to phytotoxicity than crops in unprotected culture. If the use in protected culture is also claimed, then the efficacy test should also be conducted in protected culture; this enables extrapolation to the use in unprotected culture.

## EXTRAPOLATION TABLE for EFFICACY OF NEMATICIDES

### Nematodes (soil treatment - soil and stem nematodes; crop treatment - foliar nematodes)

| **Pest or disease** | | **Crop: within the ornamental crops group** | | **Crop: outside the ornamentalcrops group** |
|---|---|---|---|---|
| **1**<br>**Test organism** | **2**<br>**Pest or disease group** | **3**<br>**Test crops (Protected, Unprotected)** | **4**<br>**Extrapolation to other crops** | **5**<br>**Data from these crops can support thef test crop (no data* or less data)** |
| *Pratylenchus penetrans*<br>PRATPE<br>(Root-lesion nematodes) | Soil nematodes [a)] | Narcissus NARSS(F),<br>Lily LILSS ( F),<br>Rose ROSSS (F or G),<br>Chrysanthemum CHYSS (G) | Ornamental crops[b)] | Potato SOLTU*, carrot DAUCS*, strawberryFRAAN* |
| *Trichodorus* spp.<br>TRIHSP<br>(free-living root-lesion) | | Tulip TULSS (F),<br>Gladiolus GLASS(F) | | Potato SOLTU*, carrot DAUCS*, onionALLCE*,<br>leek ALLPO* |
| *Meloidogyne* spp.<br>MELGSP (root-knot nematodes) | | Perennial plant (F)(excl. *Hemerocallis*),<br>*Bouvardia* BVAHY (G) | | Potato SOLTU*, carrot DAUCS*, strawberryFRAAN*, tomato LYPES*, cucumber CUMSA*, melon CUMME* |
| *Ditylenchus dipsaci*<br>DITYDI (stem nematodes) | *Ditylenchus* spp.<br>DITYSP (stem nematodes) | Tulip TULSS (F),<br>Narcissus NARSS (F) | Ornamental crops[b)] | Carrot DAUCS*, onion ALLCE*, broad beansVICFX, garlic ALLSA, alfalfa MEDSA |
| *Aphelenchoides fragariae*<br>APLOFR<br>(strawberry leaf nematode),<br>*Aphelenchoides ritzemabosi*<br>APLORI<br>(chrysanthemum leaf nematode) | *Aphelenchoides* spp.<br>APLOSP<br>(foliar nematodes) | Chrysanthemum CHYSS(G),<br>Nephrolepis NEHSS(G),<br>Anemone ANMSS (F),<br>Peony PAOMA (F) | Ornamental crops | Strawberry FRAAN |

a) Root-knot, root-lesion and free-living root-lesion nematodes. Cyst nematodes are of little importance in Dutch ornamentals.
b) On comparable cultivation media (extrapolation from soil-bound culture to artificial substrate is not possible)

# EXTRAPOLATION TABLE for EFFICACY of FUNGICIDES

## Leaf spot diseases (crop treatment)

| **Pest ordisease** | | **Crop: within the ornamentals crops group** | | **Crop: outside the ornamental crops group** |
|---|---|---|---|---|
| **1**<br>**Test organism** | **2**<br>**Pest or disease group** | **3**<br>**Test crops (Protected, Unprotected)** | **4**<br>**Extrapolation to other crops** | **5**<br>**Data from these crops can support thetest crop (no data* or less data)** |
| *Colletotrichum* spp. COLLSP | All leaf spot diseases ONLY whenefficacy is shown against 3 separate species | Lupin LUPSS (F) | Ornamental crops (F) | Spinach SPQOL, tomato LYPES, *Cucurbitaceae* 1CUCF, lettuce LACSS |
| *Phoma viburni* PHOMEV | | *Viburnum* VIBSS (F), *Clematis* CLVSS (F) | | |
| *Septoria* spp. SEPTSP | | *Hebe* HBESS (F), *Veronica* VERSP (F) | | Arable crops and vegetable crops* |
| *Cylindrocladium buxicola* CYLDBU | | *Buxus* 1BUXG (F) | | |
| *Pestalotiopsis funerea* PESPFU (needle blight or tip blight of conifers) | | Conifer 1CUPF, TAXSS(F) | | |

## Grey mould (*Botrytis* rot) (crop treatment)

| **Pest ordisease** | | **Crop: within the ornamental crops group** | | **Crop: outside the ornamental crops group** |
|---|---|---|---|---|
| **1**<br>**Test organism** | **2**<br>**Pest or disease group** | **3**<br>**Test crops (Protected, Unprotected)** | **4**<br>**Extrapolation to other crops** | **5**<br>**Data from these crops can support thetest crop (no data* or less data)** |
| *Botryotinia fuckeliana* BOTRCI (grey mould) | *Botryotinia* sp. BOTTSP | Cut flowers (G):<br>*Lisianthus* EVMGR,<br>*Gerbera* GEBSS,<br>Rose ROSSS,<br>*Chrysanthemum* CHYSS<br><br>Pot plants (G):<br>*Pelargonium* PELSS,<br>*Cyclamen* CYZSS,<br>*Begonia* BEGSS,<br>*Saintpaulia* SNPIO,<br>*Exacum affine* EXUAF | Ornamental crops ONLY if studieshave been conductedin two separate test crops | Strawberry FRAAN (F)*, lettuce LACSS*, pulses*, grapes VITVI |

## Seedling diseases/stem rot and root rot (soil treatment, irrigation treatment, drip treatment)

| **Pest ordisease** | | **Crop: Ornamentals** | | **Crops outside ornamental crop group** |
|---|---|---|---|---|
| **1**<br>**Test organism** | **2**<br>**Pest or disease group** | **3**<br>**Test crops (Protected, Unprotected)** | **4**<br>**Extrapolation to other crops** | **5**<br>**Data from these crops can support thetest crop (no data* or less data)** |
| *Pythium* sp. PYTHSP | Seedling diseases/ stem rot and root rot | *Dianthus* DINSS (G), *Chrysanthemum* CHYSS (G), *Hyacinth* HYASS (F), Tulip TULSS | Ornamental crops | Lettuce LACSA*, cucumber CUMSA, Melon CUMME*, tomato LYPES, beans PHSSS* |
| *Thanatephorus cucumeris* (=*Rhizoctonia solani*) RHIZSO | | *Saintpaulia* SNPIO (G), *Begonia* BEGSS (G), *Kalanchoe* KANBH (G) | | Potato SOLTU, lettuce LACSA, *Cucurbitaceae* 1CUCF (in soil), brassica vegetables, *Fabaceae* 1LEGF, strawberry FRAAN |
| *Phytophthora cinnamomi* PHYTCN | | *Chamaecyparis* CHCSS (F) | | |

## Powdery mildew (crop treatment)

| **Pest ordisease** | | **Crop: Ornamentals** | | **Crops outside ornamental crop group** |
|---|---|---|---|---|
| **1**<br>**Test organism** | **2**<br>**Pest or disease group** | **3**<br>**Test crops (Protected, Unprotected)** | **4**<br>**Extrapolation to other crops** | **5**<br>**Data from these crops can support thetest crop (no data* or less data)** |
| *Sphaerotheca pannosa* SPHRPA | Powdery mildew ONLY when efficacy is shown against two separate species of powdery mildew | Rose ROSSS | Ornamental crops | Strawberry FRAAN*, cucumber CUMSA*, |
| *Microsphaera alphitoides* MCRSAL (powdery mildew of oak) | | Oak *Quercus robur* QUERO (F) | | |
| *Oidium* spp. OIDISP | | *Saintpaulia* SNPIO (G), Pot *chrysanthemum* CHYSS (G) | | |

## Downy mildew (crop treatment)

| Pest or disease | | Crop: Floriculture | | Crops outside floriculture crop group |
|---|---|---|---|---|
| **1**<br>**Test organism** | **2**<br>**Pest or disease group** | **3**<br>**Test crops (Protected, Unprotected)** | **4**<br>**Extrapolation to other crops** | **5**<br>**Data from these crops can support the test crop (no data* or less data)** |
| *Peronospora chlorae* PEROCL<br>*Peronospora sparsa* PSPESR<br>*Plasmopara obducens* PLASOB | Downy mildew | *Lisianthus* EVMGR (G),<br>*Alyssum* AYSSS,<br>Rose ROSSS,<br>*Impatiens* 1IPAG | Ornamental crops | Onion ALLCE |

## Rust (crop treatment)

| Pest or disease | | Crop: Floriculture | | Crops outside floriculture crop group |
|---|---|---|---|---|
| **1**<br>**Test organism** | **2**<br>**Pest or disease group** | **3**<br>**Test crops (Protected, Unprotected)** | **4**<br>**Extrapolation to other crops** | **5**<br>**Data from these crops can support thetest crop (no data* or less data)** |
| *Puccinia horiana* PUCCHN (Chrysantemum whiterust) | Rust ONLY when efficacy is shown against 2 separate rust species | *Chrysanthemum* CHYHO (G) | Ornamental crops | Field-grown vegetables |
| *Melampsora caprearum* MELMCP<br>*Melampsora hypericorum* MELMHY | | *Salix* SAXSS,<br>*Larix* LAXSS,<br>*Hypericum* HYPSP | | |

## EXTRAPOLATION TABLE for EFFICACY of FUNGICIDES (SPECIFIC CROP PESTS OR -DISEASES)

### Botrytis (crop treatment)

| **Pest ordisease** | | **Crop: Flower bulb and flower tuber crops** | | **Crops outside the flower bulb/flower tuber group** |
|---|---|---|---|---|
| **1**<br>**Test organism** | **2**<br>**Pest or disease group** | **3**<br>**Test crops (Protected, Unprotected)** | **4**<br>**Extrapolation to other crops** | **5**<br>**Data from these crops can support thetest crop (no data* or less data)** |
| *Botrytis tulipae*<br>BOTRTU<br>(fire blight) | *Botrytis* spp.<br>BOTRSP ONLY<br>when efficacy is shown against both*Botrytis* species | Tulip TULSS | Flower bulbs ONLY when studies have been conducted in tulip AND lily OR tulip AND gladiolus | Ornamentals |
| *Botrytis elliptica*<br>BOTREL<br>(fire blight) | | Lily (Asian OR longiflorum)<br>LILAH,LILLO | | |
| *Sclerotinia draytonii*<br>SCLEDR<br>(fire blight) | | Gladiolus GLASS | | |

### Fusarium (bulb or tuber treatment) 1)

| **Pest or disease** | | **Crop: Flower bulb and flower tuber crops** | | **Crops outside the flower bulb/flower tuber group** |
|---|---|---|---|---|
| **1**<br>**Test organism** | **2**<br>**Pest or disease group** | **3**<br>**Test crops (Protected, Unprotected)** | **4**<br>**Extrapolation to other crops** | **5**<br>**Data from these crops can support thetest crop (no data* or less data)** |
| *Fusarium oxysporum* f.sp. *tulipae*<br>FUSATU | All *Fusarium* spp.<br>FUSASP | Tulip TULSS | Flower bulb/flower tuber cropsand bulb flower/tuber flower crops | Potato SOLTU, onion ALLCE, ornamentals |

1) Hot water treatment can affect the efficacy of products. If hot water treatment is the standard procedure with a crop (for example with narcissus), it must be shown that this does not affect the efficacy of the product.

## Sclerotinia blight (crop treatment)

| Pest or disease | | Crop: Floriculture crops, tree nursery crops and perennial plants | | Crops outside ornamental crop group |
|---|---|---|---|---|
| **1**<br>**Test organism** | **2**<br>**Pest or disease group** | **3**<br>**Test crops (Protected, Unprotected)** | **4**<br>**Extrapolation to other crops** | **5**<br>**Data from these crops can support the test crop (no data* or less data)** |
| *Sclerotinia sclerotiorum* SCLESC (sclerotinia blight) | *Sclerotinia* spp. SCLESP | *Skimmia* SKMSS | Floriculture crops, treenursery crops, perennial plants | Lettuce LACSA, melon CUMME, cucumber CUMSC, beans 1LEGF, oilseed rape BRSNN, common sunflower HELAN, carrots DAUCA |

## Rhizoctonia spp. (soil treatment)

| Pest or disease | | Crop: Flower bulb and flower tuber crops | | Crops outside ornamental crop group |
|---|---|---|---|---|
| **1**<br>**Test organism** | **2**<br>**Pest or disease group** | **3**<br>**Test crops (Protected, Unprotected)** | **4**<br>**Extrapolation to other crops** | **5**<br>**Data from these crops can support the test crop (no data* or less data)** |
| *Rhizoctonia tuliparum* SCLOTU (greybulb-rot) | *Rhizoctonia tuliparum* SCLOTU and *Rhizoctonia solani* RHIZSO | Tulip TULSS (F) | Flower bulb/flower tuber crops (F) | |
| *Rhizoctonia solani* RHIZSO (Rhizoctonia disease) | | Lily LILSS (F) | Flower bulb/flower tuber crops (F) | Potato SOLTU*, lettuce LACSA, *Cucurbitaceae* 1CUCF (in soil), brassica vegetables 1CRUF, beet BEAVD, *Fabaceae* 1LEGF, strawberry FRASS |

## Rhizoctonia solani (bulb or tuber treatment)

| Pest or disease | | Crop: Ornamentals | | Crops outside fornamental crop group |
|---|---|---|---|---|
| **1**<br>**Test organism** | **2**<br>**Pest or disease group** | **3**<br>**Test crops (Protected, Unprotected)** | **4**<br>**Extrapolation to other crops** | **5**<br>**Data from these crops can support the test crop (no data* or less data)** |
| *Rhizoctonia solani* RHIZSO (Rhizoctonia disease) | | Lily LILSS (F), Tulip TULSS (F) | Flower bulb/flower tuber crops (F) | Potato SOLTU |

## EXTRAPOLATION TABEL for EFFICACY of INSECTICIDES

### Aphids - sucking damage (crop treatment)

| **Pest or disease** | | **Crop: Ornamentals** | | **Crops outside ornamental crops group** |
|---|---|---|---|---|
| **1**<br>**Test organism** | **2**<br>**Pest or disease group** | **3**<br>**Test crops (Protected, Unprotected)** | **4**<br>**Extrapolation to other crops** | **5**<br>**Data from these crops can support thetest crop (no data* or less data)** |
| *Aphis gossypii*<br>APHIGO<br>(Cotton aphid)<br><br>*Myzus persicae*<br>MYZUPE<br>(green peach aphid)<br><br>*Macrosiphum euphorbiae*<br>MACSEU<br>(potato aphid)<br><br>*Aphis fabae*<br>APHIFA<br>(Black bean aphid) | Aphids excl.<br>*Phyllaphis fagi*<br>PHYAFA<br>(wooly beech aphid) | *Chrysanthemum* CHYSS (G),<br>*Hibiscus* HIBSY (G or F),<br>Rose ROSSS (G or F) | Ornamental crops ONLY when half of the research in unprotected cultured crops | Cucumber CUMSC* (G), Tomato (G) LYPES*, *Phaseolus* sp. PHSSS, *Vicia* sp. VICSS (F), lettuce LACSS |

### Mites, spider mites (larva and adult) (crop treatment)

| **Pest or disease** | | **Crop: Ornamentals** | | **Crops outside ornamental crops group** |
|---|---|---|---|---|
| **1**<br>**Test organism** | **2**<br>**Pest or disease group** | **3**<br>**Test crops (Protected, Unprotected)** | **4**<br>**Extrapolation to other crops** | **5**<br>**Data from these crops can support thetest crop (no data* or less data)** |
| *Tetranychus urticae*<br>TETRUR<br>(red spider mite) | *Tetranychus* spp.<br>TETRSP | Rose ROSS (G),<br>*Chrysanthemum* CHYSS (G),<br><br>*Dianthus* DINSS (G),<br>*Ficus* FIUSS (G),<br>*Hibiscus* HIBSY (G),<br>*Hedera* HEESS(G) | Ornamental crops | Cucumber CUMSC* (G), Tomato LYPES* (G), beans PHSSS* (G) |

## Caterpillars (crop treatment)

| Pest ordisease | | Crop: Ornamentals | | Crops outside ornamentals crop group |
|---|---|---|---|---|
| **1**<br>**Test organism** | **2**<br>**Pest or disease group** | **3**<br>**Test crops (Protected, Unprotected)** | **4**<br>**Extrapolation to other crops** | **5**<br>**Data from these crops can support the test crop (no data* or less data)** |
| *Spodoptera exigua* LAPHEG (Beet armyworm) | Caterpillars (G) | Rose ROSSS (G),<br>*Chrysanthemum* CHYSS (G) | Ornamental crops (G) | Lettuce LACSA |
| *Chrysodeixis chalcites* PLUSCH (Tomato looper) | | | | |
| *Orthosia spp.* ORTHOSP (cloudeddrab moths) | Free-living species of caterpillars | *Betula* BETSS,<br>*Salix* SAXSS, | Ornamental crops (F) | Apple MABSD*, pear PYUCO* |

## Thrips (crop treatment)

| Pest or disease | | Crop: Ornamentals | | Crops outside the ornamentals crop group |
|---|---|---|---|---|
| **1**<br>**Test organism** | **2**<br>**Pest or disease group** | **3**<br>**Test crops (Protected, Unprotected)** | **4**<br>**Extrapolation to other crops** | **5**<br>**Data from these crops can support the test crop (no data* or less data)** |
| *Frankliniella occidentalis* FRANOC (Western flower thrips)<br><br>*Thrips tabaci* THRITB (Tobacco thrips)<br><br>*Thrips fuscipennis* THRIFU | Thrips | *Chrysanthemum* CHYHO (G),<br>*Saintpaulia* SNPIO (G),<br>*Cyclamen* CYZSS (G),<br>Rose ROSS (F) | Ornamental crops | Sweet pepper CPSAN*, aubergineSOLME*, cucumber CUMSC*, French bean PHSSS* (G), strawberry FRAAN*, leek ALLPO*, onion ALLCE*, brassica vegetables BRSOL* |

## Mealybugs and scale insects ((Pseudo)coccidae) (larva and imago) (crop treatment)

| **Pest or disease** | | **Crop: Ornamentals** | | **Crops outside ornamental crops group** |
|---|---|---|---|---|
| **1**<br>**Test organism** | **2**<br>**Pest or disease group** | **3**<br>**Test crops (Protected, Unprotected)** | **4**<br>**Extrapolation to other crops** | **5**<br>**Data from these crops can support the test crop (no data* or less data)** |
| *Pseudococcus citri*<br>PSECCI (Citrus mealybug)<br><br>*Pseudococcus maritimus*<br>PSECMA<br>(Grape mealybug) | *Pseudococcus* sp.<br>PSECSP | *Ficus* FIUSS (G),<br>*Kalanchoe* KANBH (G),<br>Rose ROSSS (G) | Ornamental crops (G) | Sweet pepper CPSAN*, tomato LYPES* |
| *Parthenolecanium corni*<br>LECACO<br>(European fruit lecanium) | *Coccoidea*<br>1CCOIF<br>*Diaspididae*<br>1DIASF | *Prunus laurocerasus*<br>PRNLR (F) | Ornamental crops (F) | Apple MABSD*, Pear PYUCO* |

## Vine weevils and leaf-eating weevils (soil treatment for larva; crop treatment for adults)

| **Pest or disease** | | **Crop: Ornamentals** | | **Crops outside ornamental crops group** |
|---|---|---|---|---|
| **1**<br>**Test organism** | **2**<br>**Pest or disease group** | **3**<br>**Test crops (Protected, Unprotected)** | **4**<br>**Extrapolation to other crops** | **5**<br>**Data from these crops can support the test crop (no data* or less data)** |
| *Otiorhynchus sulcatus*<br>OTIOSU<br>(black vine weevil)<br>(Larvae) | *Otiorhynchus* sp.<br>OTIOSP larvae | *Taxus* TAXSS (F),<br>*Astilbe* 1ATLG (F) | Ornamental crops | |
| *Otiorhynchus sulcatus*<br>OTIOSU<br>(black vine weevil)<br>(Adults) | *Otiorhynchus* spp.<br>OTIOSP<br>adults and adults of leaf-eating weevils (*Phyllobius* sp. PLLBSP and *Polydrusus* sp. POLOSP) | *Taxus* TAXSS (F),<br>*Euonymus* 1EUOG (F),<br>*Cyclamen* CYZSS (G) | Ornamental crops | Strawberry FRAAN* |

## Whitefly (larva and adult) (crop treatment)

| Pest or disease | | Crop: Ornamentals | | Crops outside Ornamentals crop group |
|---|---|---|---|---|
| **1**<br>**Test organism** | **2**<br>**Pest or disease group** | **3**<br>**Test crops (Protected, Unprotected)** | **4**<br>**Extrapolation to other crops** | **5**<br>**Data from these crops can support the test crop (no data* or less data)** |
| *Bemisia tabaci*<br>BEMITA<br>(silverleafwhitefly)<br><br>*Trialeurodes vaporariorum*<br>TRIAVA<br>(Greenhousewhitefly) | Whitefly | *Poinsettia* EPHPU (G),<br>*Gerbera* GEBSS (G),<br>*Fuchsia* FUCSS (G) | Ornamental crops (G) | Aubergine SOLME*, tomato LYPES*,<br>cucumber CUMSC* |

## EXTRAPOLATION TABLES for EFFICACY of INSECTICIDES (SPECIFIC CROP PESTS OR -DISEASES)

### Aphids (virus transmission) (crop treatment)

| **Pest or disease** | | **Crop: Flower bulb/flower tuber crops** | | **Crops outside ornamental crops group** |
|---|---|---|---|---|
| **1**<br>**Test organism** | **2**<br>**Pest or disease group** | **3**<br>**Test crops (Protected, Unprotected)** | **4**<br>**Extrapolation to other crops** | **5**<br>**Data from these crops can support thetest crop (no data* or less data)** |
| Lily symptomless virus<br>LSV000<br>(LSV)<br><br>Tulip breaking virus<br>TBV000<br>(TBV) | non-persistent viruses | Lily LILSS (F) | Flower bulb/flower tuber crops | Potato SOLTU |

### Bulb mites and tulip gall mites (bulb or tuber treatment)

| **Pest or disease** | | **Crop: Flower bulb/flower tuber crops** | | **Crops outside ornamental crops group** |
|---|---|---|---|---|
| **1**<br>**Test organism** | **2**<br>**Pest or disease group** | **3**<br>**Test crops (Protected, Unprotected)** | **4**<br>**Extrapolation to other crops** | **5**<br>**Data from these crops can support the test crop (no data* or less data)** |
| *Rhizoglyphus echinopus*<br>RHIGEC<br>*Rhizoglyphus robini*<br>RHIGRO<br>(bulb mite) | Bulb mites | Lily LILSS (G) | Flower bulb/flower tuber crops | |
| *Eriophyes tulipae*<br>ACEITU<br>(tulip gall mite) | Gall mites | Tulip TULSS (G) | | |

## Bulb and rust mites (crop treatment)

| **Pest or disease** | | **Crop: Tree nursery crops and perennial plants** | | **Crops outside ornamental crop group** |
|---|---|---|---|---|
| **1**<br>**Test organism** | **2**<br>**Pest or disease group** | **3**<br>**Test crops (Protected, Unprotected)** | **4**<br>**Extrapolation to other crops** | **5**<br>**Data from these crops can support the test crop (no data* or less data)** |
| *Cecidophyopsis psilaspis*<br>ERPHPS<br>(yew gall mite)<br><br>*Phytoptus canestrinii*<br>PHTPCA<br>(Boxwood bud mite) | *Eriophyidae*<br>1ERIOF (galland rust mites) | *Buxus* (BUXSE),<br>*Taxus* (TAXBA) | Tree nursery crops and perennial plants | Apple MABSD, pear PYUCO |
| *Aculus fockeui*<br>VASAFL<br>(plumnursery mite) | | *Prunus* (1PRNG) | | |

## Echinothrips (larva and adult) (crop treatment)

| **Pest or disease** | | **Crop: Floriculture crops, tree nursery crops and perennial plants** | | **Crops outside ornamental crop group** |
|---|---|---|---|---|
| **1**<br>**Test organism** | **2**<br>**Pest or disease group** | **3**<br>**Test crops (Protected, Unprotected)** | **4**<br>**Extrapolation to other crops** | **5**<br>**Data from these crops can support thetest crop (no data* or less data)** |
| *Echinothrips americanus*<br>ECHTAM<br>(Echinothrips) | | *Spathiphyllum* SQFSS (G),<br>*Dieffenbachia* DIFSS (G) | Floriculture crops (G),<br>tree nursery crops (G),<br>perennial plants (G) | |

## Leafminers (larva) (crop treatment)

| **Pest or disease** | | **Crop: Floriculture crops, tree nursery crops and perennial plants** | | **Crops outside ornamental crop group** |
|---|---|---|---|---|
| **1**<br>**Test organism** | **2**<br>**Pest or disease group** | **3**<br>**Test crops (Protected, Unprotected)** | **4**<br>**Extrapolation to other crops** | **5**<br>**Data from these crops can support thetest crop (no data* or less data)** |
| *Liriomyza trifolii*<br>LIRITR (American serpentine leafminer) | *Liriomyza*<br>1LIRIG (leafminers) | *Gerbera* GEBSS (G),<br>*Gypsophila* GYPSS (G),<br>*Dendranthema* CHYHO (G) | Floriculture crops,<br>tree nursery crops and perennial plants | melon CUMME, cucumber CUMSC*, lettuce LACSS, tomato LYPES* |

## True bugs (crop treatment)

| **Pest or disease** | | **Crop: Tree nursery crops and perennial plants** | | **Crops outside ornamental crop group** |
|---|---|---|---|---|
| **1**<br>**Test organism** | **2**<br>**Pest or disease group** | **3**<br>**Test crops (Protected, Unprotected)** | **4**<br>**Extrapolation to other crops** | **5**<br>**Data from these crops can support thetest crop (no data* or less data)** |
| *Lygocoris pabulinus* LYGUPA (Common green capsid) | *Miridae*<br>1MIRIF (other true bug species,*Miridae*) | *Forsythia* FOSSS | Tree nursery crops and perennial plants | Apple MABSD, pear PYUCO |

## EXTRAPOLATION TABLES for EFFICACY of HERBICIDES

**Remarks on the extrapolation of herbicides:**

Extrapolation from one weed species to another is usually not possible because the sensitivity to herbicides may differ per species of weed. With similar uses, extrapolation to a crop that can compete better with weeds is possible. Outdoors, weeds are generally more hardened and therefore less susceptible to herbicides. Extrapolation is therefore possible from unprotected culture toprotected, soil-bound culture. For a soil herbicide, it is not possible to extrapolate from soil-bound culture to uses in pots or containers.

| **Pest or** | | **Crop - crop group** | |
|---|---|---|---|
| **1**<br>**Test organism** | **2**<br>**Extrapolation** | **3**<br>**Test crops (Protected, Unprotected)** | **4**<br>**Extrapolation** |
| annual grasses3ANGWT, volunteer cereals NNNGA | to entire group of annual grasses ONLY when | In principle, for extrapolation of efficacy it does not matter in which crop the effect has been tested, as long as the use (e.g. application time, dosage of the product, crop duration,extent of soil coverage by crop, soil type, weed assortment etc.) of the crops is comparable.<br><br>Use of contact herbicide in unprotected culture extrapolated to use of acontact herbicide in pots or container crops, unprotected or protected.<br><br>For efficacy, uses in unprotected culture can be extrapolated to protected culture. | |
| perennial grasses 3PEGWT | Extrapolation to the entire group of perennial grasses | | |
| annual broadleaved weeds 3ANDIT | Extrapolation to the entire group of annualbroadleaf weeds ONLY when 3 relevant species are tested | | |
| perennial broadleaf weeds 3PEDIT | Extrapolation to the entire group of perennial broadleaf weeds ONLY when 3relevant species are tested | | |

## EXTRAPOLATION TABLES for PHYTOTOXICITY

If there are no indications of phytotoxicity in the efficacy tests (for similar uses) or in the formulation of the product, nematicides, fungicides, acaricides and insecticides do not require separatephytotoxicity data. The table below therefore only applies if the above conditions are not met.

The crops listed are examples of sensitive ornamental crops (for phytotoxicity or visible residue).

## FUNGICIDES, INSECTICIDES, ACARICIDES AND NEMATICIDES

| **Crop: Ornamentalcrops** | | **Crops outside ornamental crop group** |
|---|---|---|
| **1**<br>**Test crops (Protected, Unprotected)** | **2**<br>**Extrapolation to other crops** | **3**<br>**Data from these crops can support the testcrop** |
| TulipTULSS<br>Lily LILSS<br>*Lisianthus* (Eustoma)EVMGR<br>Rose ROSSS<br>*Chrysanthemum* (*Dendranthema*) CHYSS<br>*Gerbera*GEBSS<br>*Dianthus* DINSS<br>*Chalkplant Gypsophila Muralis* GYPMU<br>*Fuchsia* FUCSS<br>*Begonia* BEGSS<br>*Ficus benjamina*FIUBE<br>*Saintpaulia* SNPIO<br>*Exacum* EXUSS<br>*Cyclamen* CYZSS | Extrapolation to ornamental crops **only when** 3 different crops are tested | Data acquired in crops outside ornamentals, but from the same botanicalfamily, can be used as support.<br><br>Data acquired in sensitive crops such as cucumber, lettuce, spinach in protected cultivation can be substituted when determining phytotoxicity. |

For herbicides, the risk of phytotoxicity in the crop is high and the consequences (also economic) are often greater than with other products. Therefore, separate phytotoxicity studies are required for the use of herbicides.

## HERBICIDES

| **Crop: Ornamental crops** | | **Crops outside ornamental crop group** |
|---|---|---|
| **1**<br>**Test crops**<br>**(Protected, Unprotected)** | **2**<br>**Extrapolation to other crops[1]** | **3**<br>**Data from these crops can support the test crop** |
| At least three sensitive floriculture crops | Floriculture crops, tree nursery crops and perennial plants | Tests in sensitive crops outside ornamental crops can reduce the number or scope of required studies. |
| Tulip TULSS (F) **and** *Hyacinth* HYASS (F) **and** *Narcissus*NARSS (F) | Autumn-planted flower bulb/flower tuber crops and bulb flower/tuber flower crops | |
| Lily LILSS (F) **and** *Gladiolus* GLASS (F) | Spring-planted flower bulb/flower tuber crops and bulbflower/tuber flower crops | |

[1] If data are available from floriculture crops, autumn-planted flower bulb/flower tuber crops and bulb flower/tuber flower crops as well as spring-planted flower bulb/flower tuber crops and bulb flower/tuber flower crops, then extrapolation to the ornamental crops group is possible.