

**Extension to VG02030  
Integrated Pest  
Management in the Green  
Bean Industry**

John Duff  
QLD Department of Primary  
Industries & Fisheries

Project Number: VG06016

## **VG06016**

This report is published by Horticulture Australia Ltd to pass on information concerning horticultural research and development undertaken for the vegetable industry.

The research contained in this report was funded by Horticulture Australia Ltd with the financial support of the vegetable industry.

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ISBN 0 7341 1943 7

Published and distributed by:  
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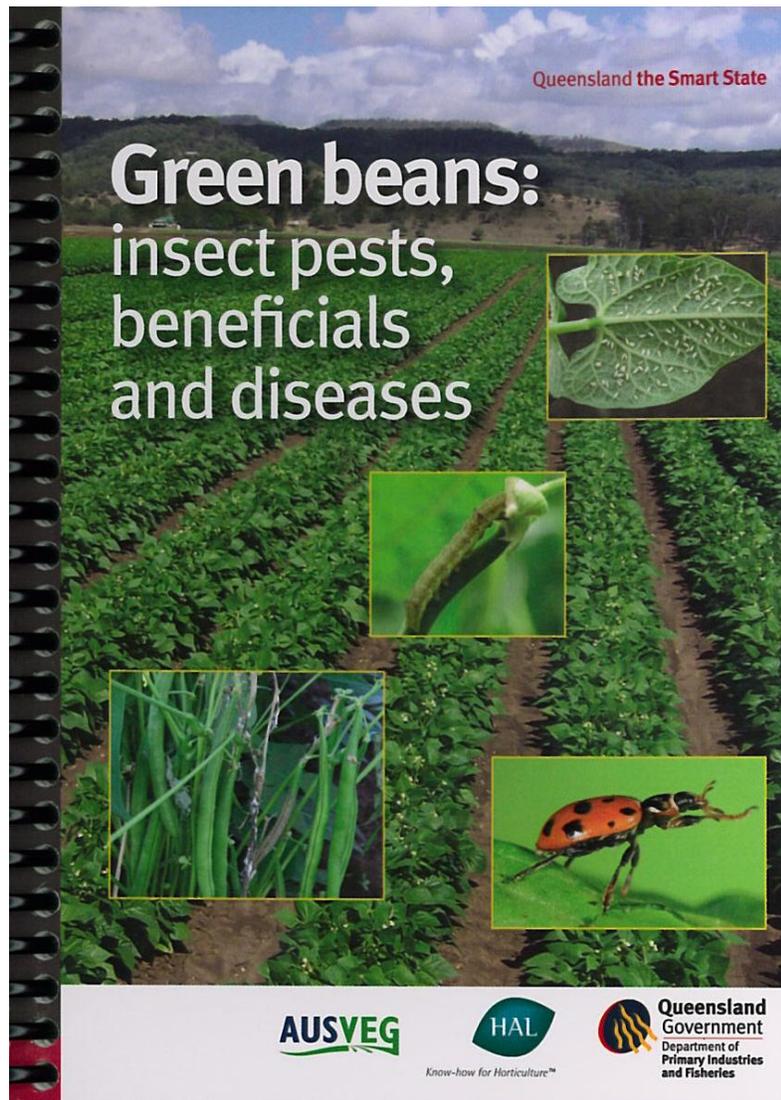
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# Final report

Horticulture Australia Project VG06016



Extension to VG02030  
“Integrated Pest Management in the  
Green Beans Industry”

## **Media summary**

The national green bean industry is worth approximately \$65 million annually, with Queensland and Tasmania dominating the market with around 40 per cent each in the fresh market produce and process industries respectively. It is a valuable market, but growers lose hundreds of thousands of dollars each year in unsaleable crops due to losses from pests and diseases.

There are more insect pests and diseases found attacking green bean crops than any other vegetable crop. There are as many as 40 known insect pests to date, some of which are major pests, but the majority of which are only minor. There are also 27 recorded plant diseases that can be found attacking green beans from the seedling stage right through to harvest. Information and photographs of the pests and diseases and of beneficial insects found in the crop has been compiled into a recent publication known as a ute guide, which will allow growers to promptly identify and act on the pests or diseases (or beneficial insects) found in their green bean crop.

The guide has the potential to become a green bean grower's reference tool. It contains over 200 images and substantial information on the most common and less known insect pests and beneficial insects and diseases. It also includes a simple key to disorders of seedlings, roots, stems, leaves, flowers and pods, and where to find in the ute guide the likely cause of these disorders.

The guide provides a definition of IPM, and advice to growers on crop monitoring, which is the cornerstone to any IPM system. It also provides information on the types of pathogens responsible for causing plant diseases as well as general information on disease and insect life cycles.

## **Project Introduction**

The national green bean industry is worth approximately \$65 million annually, with Queensland and Tasmania dominating the market with around 40 per cent each in the fresh market produce and process industries respectively. It is a valuable market, but growers lose hundreds of thousands of dollars each year in unsaleable crops due to losses from pest and disease.

Research into integrated pest management (IPM) against the myriad of invaders attacking green beans has been on going since 2002, at which stage a research project (VG02030) centred on developing an IPM system suitable for the green bean industry commenced. This was necessary primarily due to the increasing risk of insecticide resistance developing in key insect pests as a result of access to only a small range of insecticides, limiting the level of insect pest control achieved by growers.

During this initial project, 36 insect pests and 30 beneficial insects were observed in green bean crops throughout Queensland, many of which growers were not familiar. On the strength of the positive potential achieved in this project an extension was granted to (VG06016), enabling the compilation of a ute guide of these insects as well as diseases, that growers, consultants, agrichemical resellers and the like could use to help with in-field monitoring of green bean crops.

This ute guide was published through Department of Primary Industries and Fisheries, Queensland (DPI&F) with free copies made available to green bean growers and those that have helped put the guide together during the life of the project. Other interested people will need to purchase the ute guide from the DPI&F bookshop. 500 copies of the ute guide were published for this purpose. The following are extracts from the guide highlighting the areas covered in the publication.

## Development of the Green Bean Ute Guide

The green bean ute guide was developed to include the full range of insect pests and beneficial insects and diseases that can be found in a green bean crop during the growing season. This ute guide was based on those currently available and developed by DPI&F with relevant information on each insect or disease and where it is most likely to be found on the plant. The ute guide consists of four basic areas with each section being colour coded for easy recognition with the insects or diseases listed in alphabetical order according to their common name. Images were collected from the DPI&F image library, currently held at the Maroochy Research Station, interstate researchers, overseas researchers (Germany and the United States), and also taken in the field when needed. Rather than re-using existing images, new images were used, where possible, to add to the range of images available in circulation.

These images were then collated and sorted into a user friendly publication that growers can rely upon to help with identification of their particular problem in the green bean crop.

The front matter or the front section of the book consists of terminology and an overview of insects and diseases, with the following sections covering the insect pests, beneficial insects and then the diseases likely to be found in green beans.

The following is an extract from the table of contents of the guide highlighting the areas covered in the publication.

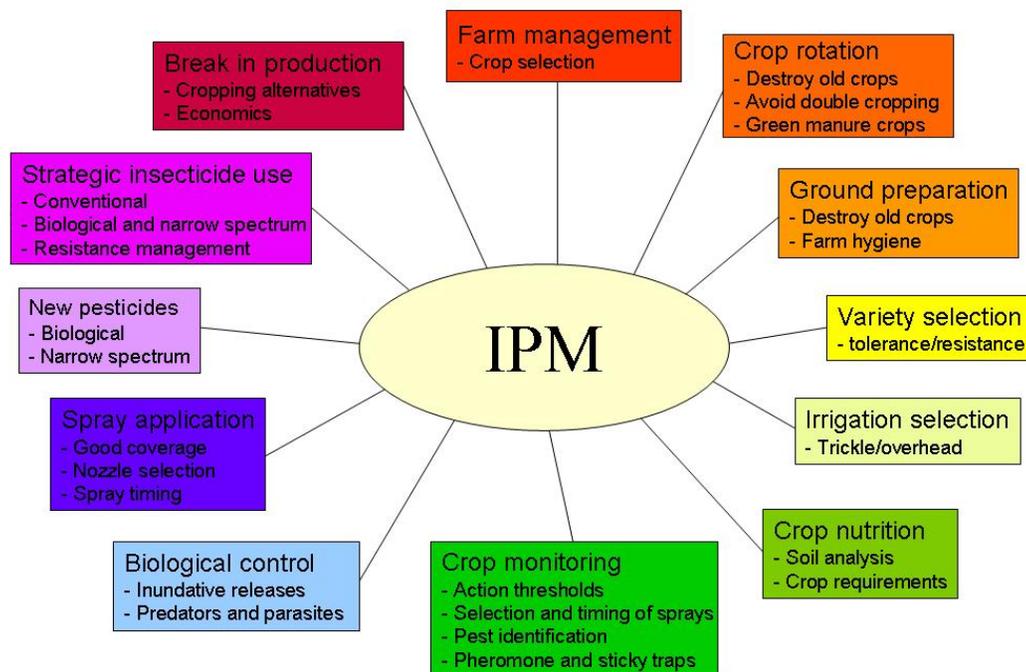
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## The Front Matter

The front matter of the publication contains information vital to growers on what constitutes IPM and what can be done to start implementing IPM on the farm. This section describes the various types of plant pathogens (fungi, bacteria, viruses and nematodes) as well as the most commonly found symptoms of diseases, as well as other factors that can produce symptoms similar to diseases. This section also covers the basics of insect classification, the type of life cycles found in the insect world, how to go about monitoring for insect pests within a green bean crop and what tools can be employed as part of an IPM program, as illustrated below in the diagram taken from the ute guide.

The section contains a basic diagnostic key that covers the various plant structures of green beans from the seedling stage, roots, stems, leaves, flowers and pods. No publication is complete without a “Glossary” containing explanations of technical terms used throughout the publication. There is also a list of references used and further reading including those other ute guides currently available.



## Insect Pest Section

This section covers those insects that can be found damaging green beans and were found as part of the “Integrated Pest Management in the Green Bean Industry” project VG02030 and during the early stages of this current project. There are currently 40 known insect pests, some of which are major pests, but the majority of which are only minor. A list of all 40 insect pests is below.

### Pests

Bean fly.....	3
Bean looper.....	5
Bean podborer.....	7
Bean root aphid.....	9
Bean spider mite.....	11
Brown bean bug, Pod sucking bug.....	13
Brown mirid.....	15
Cluster caterpillar.....	17
Corn earworm, Native budworm .....	19
Cutworms.....	23
Flea beetles: Brown flea beetle, Striped flea beetle and .	
Black flea beetle.....	25
Giant grasshopper.....	27
Grass blue/Common grass blue butterfly.....	29
Green peach aphid.....	31
Green vegetable bug, Green stink bug and .	
Redbanded shield bug.....	33
Leafhoppers: Spotted leafhopper, Lucerne leafhopper, .	
Vegetable leafhopper, Common brown leafhopper.....	35
Leaf weevil.....	37
Loopers: Tobacco looper, Vegetable looper and Soybean looper.....	39
Redshouldered leaf beetle.....	41
Rutherglen bug.....	43
Silverleaf whitefly.....	45
Spur-throated locust.....	47
Thrips: Western flower, Tomato, Bean blossom, Plague, Melon, Onion..	49
Two-spotted mite.....	51



Silver leaf whitefly on a bean leaf.



*Helicoverpa* damaging a young bean pod.



Thrips inside a bean flower.

Each insect pest is listed by its common name (if known) followed by the scientific name. There is a description of the insect, both the adult and nymph or larvae, as both may be responsible for attacking the crop or may be found in the crop. There is information on the type of damage caused by the insect pest plus where to look for the pest. Some management options have also been given if available. Images in this section generally included both the adults and young (larvae or nymphs). Images were collected that have not been used in previous publications, which will add to the overall number currently in circulation and to help with better recognition by growers, consultants and agronomists.

## Beneficial Insect Section

The beneficial insects have been separated into two groups, those known as predators and those known as parasitoids.

### ***Predators***

- predators are the group of insects that directly feed on their prey, attacking a wide range of insects such as aphids, thrips, eggs, nymphs and larvae,
- they can be found either in the soil (ground beetles and the brown earwig), or on the plant (ladybird beetles, lacewings, predatory bugs, spiders),
- move quickly in search of their prey,
- in a number of cases both the adult and larvae or nymphs are known to feed on other insects and are termed generalist predators,
- there are however some predators that are more specialised, such as hover fly larvae which feed only on aphids and predatory mites which feed only on plant feeding mites,
- predators are often more susceptible to pesticides because they are more exposed when moving around the crop consuming other insects.

### ***Parasitoids***

- are generally tiny wasps, but there are also parasitic flies,
- they lay their eggs within or on the insect host, completing their development by consuming the host,
- known to attack the eggs of certain insect pests, the larvae of certain caterpillar pests and even the adult stage of the green vegetable bug,
- they generally need to supplement their diet with nectar, so some weeds may be important for their continued presence,
- are easily killed by broad spectrum insecticides and some narrow spectrum insecticides, but can thrive if biological insecticides are used.

This section covers those beneficial insects found in green beans as part of the “Integrated Pest Management in the Green Bean Industry” project VG02030 and during the early stages of this current project, as well as those known to attack the wide range of insect pests found in green beans. There have been 23 known predatory insects and 12 parasitoids identified from green bean crops as part of project VG02030 and this project. These beneficial insects are known to attack the range of insect pests that can be found damaging green bean crops and are listed below.

Each beneficial insect is listed alphabetically using its common name (if known) followed by the scientific name. There is a description of the insect, both the adult and nymph or larvae, as both may be responsible for attacking an insect pest. There is information of what the beneficial insect might look similar to and the range of insect pests that are attacked by the beneficial insect. If known information on how significant that particular beneficial insect might be is also given. Images in this section generally include both the adults and young and where possible the eggs. Images were collected that have not been used in previous publications which will add to the overall number currently in circulation and to help with better recognition

by growers, consultants and agronomists. Where possible, images of the beneficial insect attacking an insect pest were also included.

**Beneficials (Predators)**

Apple dimpling bug (Yellow mirid)..... 55  
 Assassin bug..... 57  
 Bigeyed bug.....58  
 Brokenbacked bug.....59  
 Brown lacewing..... 61  
 Brown smudge bug.....63  
 Common brown earwig.....65  
 Damsel bug.....67  
 Glossy shield bug.....69  
 Green lacewing..... 71  
 Hover flies..... 72  
 Long-legged flies..... 73  
 Minute two-spotted ladybird beetle..... 74  
 Pirate bug..... 75  
 Predatory ground beetles: Green soldier beetle, .  
 Bombardier beetle..... 77  
 Predatory shield bug.....79  
 Predatory thrips.....80  
 Red and blue beetle.....81  
 Spiders.....83  
 Striped ladybird beetle.....85  
 Transverse ladybird beetle.....87  
 White collared ladybird beetle.....89



Assassin bug feeding on a *Monolepta* beetle.

**Beneficials (Parasitoids)**

Aphid parasitoids.....93  
 Green vegetable bug egg parasitoid.....95  
 Looper parasitoid.....97  
 Microplitis parasitoid.....99  
 Orange caterpillar parasitoid.....101  
 Orchid dupe..... 103  
 Tachinid flies..... 105  
 Telenomus egg parasitoid..... 106  
 Trichogramma egg parasitoid..... 107  
 Trichopoda..... 109  
 Two-toned caterpillar parasitoid..... 111  
 Whitefly parasitoid.....113



Small parasitoid from a looper caterpillar.



## Plant Disease Section

It was important to include plant diseases in this ute guide, so that growers could make important decisions when trying to implement an integrated pest management program. Plant diseases should be a part of any package, as some fungicides can have deleterious effects on beneficial insects. The correct choice of any pesticide is critical if a grower is trying to encourage the establishment of beneficial insects on the farm or even within a crop of beans.

The ute guide includes 27 recorded plant diseases in Australia that can be found attacking green beans from the seedling stage through to harvest as shown below. This list is taken directly from the ute guide.

### Diseases

Alfalfa mosaic.....	117
Angular leaf spot.....	119
Anthracnose.....	121
Aphanomyces root rot.....	123
Ascochyta spot.....	125
Ashy stem blight (Charcoal rot).....	127
Bacterial brown spot.....	129
Bean Common Mosaic Virus (BCMV).....	131
Bean Yellow Mosaic Virus (BYMV).....	133
Black root rot.....	135
Botrytis pod rot.....	137
Cercospora leaf spot.....	139
Common bacterial blight.....	141
Cottony leak and stem rot.....	143
Damping-off.....	145
Fusarium root rot.....	147
Halo blight.....	149
Peanut Mottle Virus (PeMoV/PMV).....	151
Pleiochaeta brown spot.....	153
Pod twist.....	155
Red root complex.....	157
Rhizoctonia rot.....	159
Root-knot nematode.....	161
Rust.....	163
Sclerotinia rot.....	165
Sclerotium rot.....	167
Summer death.....	169



Halo blight on butter beans.

As with the other sections, there is information describing each disease, how it is spread within the paddock and between paddocks, what alternative hosts you can find the disease on and any management options available to growers.

Although the selected images in this section show the most typical symptoms for each disease problem, symptoms may vary from those shown, and so specialist advice may be necessary to confirm a diagnosis. Additional images are also included to increase the chance of correct disease identification.

### Additional areas of interest

With such a large range of beneficial insects, it is important to try and limit the effects of the various pesticides on these beneficial populations. For this reason a table highlighting the effects that pesticides have on certain beneficial insect groups was also included in the ute guide. The information in this table is a guide only and contains many gaps, in particular in relation to the impact of fungicides on many beneficial insect groups. Care must be taken at all times when using pesticides, as they may be causing more harm to IPM systems than good in disease control.

For quick easy reference, an index is included at the back of the ute guide. This section includes both the scientific names and common names of the insects and diseases as well as other relevant keywords found throughout the ute guide.



## **Distribution**

As part of the 7<sup>th</sup> IPM in Green Beans Newsletter (Appendix 1), there was a request to help update the database which was to be used to distribute the ute guide to growers. The Newsletter was emailed, faxed and posted to those on the current database, with assistance from a number of other sources eg Gympie Pack House and the Queensland Vegetable Industry Development Officer (IDO).

There were 158 stakeholders on this database, of whom only 64 have replied to update their details. Two (2) of the bigger bean producer have at least 29 additional growers on their books who are not in the database. It is possible that the database numbers would fluctuate from year to year as growers move in and out of growing green beans.

500 copies of the ute guide were printed.

93 have been posted out – 58 to growers

- 35 have gone out to state IDOs, project team members  
and individuals who have helped compile this publication

Of the remainder of the ute guides, 300 will be sent to the Queensland Government Book Shop to be added to their catalogue of saleable publications, while 108 will remain at the Gatton Research Station to be handed out to any grower who requests a ute guide and has not yet received one.

An article was produced for the Vegetables Australian magazine Volume 4.2 describing this ute guide (Appendix 2). It was hoped that green bean growers would read this article and be encourage to up date their contact details on the database and therefore enabling a free copy of the ute guide to be send out to them.

## Evaluation report

A survey sheet was developed and sent to stakeholder who have received a copy of the publication to obtain some feedback on what they thought of the ute guide. This was conducted via email for a speedy response from growers, grower groups and grower companies. 25 survey forms were dispatched by this manner due to the potential of reaching over 50 growers. A copy of the questionnaire is in Appendix 3. Growers were asked to rate a series of questions on how they perceived the ute guide. To date only 8 growers have returned completed questionnaires. Their responses are as follows:

**Content:** was the overall content of the ute guide useful to you or not very useful?

*The majority of respondents indicated the content to be “very useful”.*

**Quality of information:.**

**Page layout**

*Over 70% of the respondents felt the layout was “very useful” while 30% of the respondents felt it was only slightly less than “very useful”.*

**Adequate information on each insect or disease**

*70% of respondents felt the information was “very useful” while 30% of respondents felt it was only slightly less than “very useful”.*

**Colour images**

*All respondents felt the images were “very useful”.*

**Adequate illustrations/images:** were there sufficient illustrations and images for you to identify the various problems you encounter in your green bean crop?

*All respondents felt there were sufficient images to help with identification.*

**Answer the following;**

**Was there a comprehensive list of insect pests**

**Was there a comprehensive list of beneficial insects**

**Was there a comprehensive list of plant pathogens**

*All respondents felt there was a comprehensive list of insect pests, beneficial insects and plant pathogens.*

**Rate the following:**

**Key to Green Bean Disorders**

**Glossary**

**Durability of book**

**Overall length**

**Impact of pesticides on beneficial insects**

*The majority of respondents felt that the above information was “very useful” or “just right” with regards the overall length of the publication. 30% of respondents felt the glossary could have a bit more work done to it, while 14% of respondents felt the durability was questionable, while 14% of respondents also felt the overall length was not quite right, perhaps a little long or cumbersome. One respondent did question the usefulness of the “pesticides on beneficial insects table” and stated that ‘he has seen this table done in 3 different colours which works well’.*

**Other comments – these were either part of the survey forms or have been received separately via emails.**

*Grower 1 – “John I think this book will be very useful. Thank you.”*

*Grower 2 – “Congratulations on a very well thought out and informative manual. It will certainly find a place in my work vehicle.”*

*Grower 3 – “This is a great aid to scouting”.*

*Grower 4 – “Congratulation to you and your team for producing such a useful tool. The Green Bean ute pocket guide is extremely well presented and laid out, and packed with great information, we have been handing them out to growers with good response, thanks”.*

*Grower 5 – “Thank you very much for my copy of the Guide. It is a terrific reference and congratulations to all involved in its production. I like the very comprehensive list of Predators”.*

*Grower 6 – “Good to have handy book available – wish we’d had something like this years ago”.*

It would appear that very little could have been done to improve on the publication. The “Glossary” and the “pesticide table” could have had more work done on them with perhaps a little bit more work on the “key to disorders” section.

## Source of information

Images - Image database at Maroochy Research Station  
Internet sources [www.plantdiseases.com](http://www.plantdiseases.com)  
Alabama Cooperative Extension system  
Researchers from Qld DPI&F, NSW DPI  
Professional photographer from Gatton

References - A number of useful publications were used while compiling this ute guide.

Agrios, G. (1978). Plant Pathology 2<sup>nd</sup> ed. (Academic Press, Inc., London).

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Llewellyn, R. (2000). Sweet Corn Insect Pests and their Natural Enemies – an IPM field guide. BioResources Pty Ltd.

Lloyd, D. *et al.* (2002). Lucerne Pests and Disorders: The Ute Guide. Department of Primary Industries & Fisheries.

McDougall, S. and Creek, A. (Ed.) (2003). Pests, Beneficials, Diseases and Disorders in Lettuce: Field Identification Guide. NSW Agriculture.

Persley, D. (Ed.) (1994). Diseases of Vegetable Crops. Information series QI93024, Department of Primary Industries & Fisheries

Wood, P. *et al.* (2000). Crop Insects: The Ute Guide – Northern Grain Belt Edition. Department of Primary Industries & Fisheries.

## Budget Summary

This project was managed from January 2007 until December 2008 with a total budget of \$125,377.55 of which \$72,164.11 (57.56%) was HAL funded.

Approximate costs associated with VG06016

	Printing and publication costs	Salary and related costs	General operating costs (trials, vehicle, reference material, office on costs etc)
Costs	\$17,603	\$25,657	\$28,904
% HAL funds	24.4%	35.6%	40%
% total costs	14%	20.5%	23.1%

The publication costs included the assistance of a professional publicist who helped with the type setting, image preparation, colour choice, file creation and organising the printing process including reviewing the proofs and corrections needed as well as viewing the second set of proofs before final printing.

# green beans IPM newsletter

keeping you up to date with Insect Pest Management (IPM) in green beans

Volume 7 August 2008

## Integrated Pest Management in the Green Bean Industry [HAL Project – VG02030/VG06016]

It has been a while since a green bean newsletter was produced and it is only fitting that one is being sent out now when the production of a new field guide is about to be released for green bean growers as an extension to the project initiated by the green bean industry.

The aim of this project extension was to develop an extension booklet that growers, consultants, resellers and researchers can use to help in the identification of insects and diseases in green bean crops.

The reason for seeking this extension to VG02030 in the form of a field guide, was due to a number of growers expressing the need for such a publication. In the last newsletter sent out to all stakeholders, there was a questionnaire put to everyone about the perceived need for such a publication. Those that returned the questionnaire indicated that they would like to see a Ute/Field guide for their industry.

This field guide includes over 200 colour photographs depicting the main (and many of the less common) insect pests and beneficial insects, as well as the diseases that can be found in a green bean crop during the growing season. This field guide contains information on each insect or disease and where it is most likely to be found on or in the plant. The images for this field guide have been collated and sorted into a user friendly publication that growers can rely upon to help in their identification of their particular problem in the green bean crop. This field guide will be published through DPI&F with copies being made available free of charge to green bean growers on our database. Other interested people will need to purchase the field guide from the DPI&F bookshop at a price that is yet to be determined. The guide will be invaluable to both new and established growers, consultants and agribusinesses alike.

Since the last newsletter, it is quite possible that our database needs updating. So, if you are still growing green beans and would be keen to get a copy of this green bean field guide, can you please supply us with a current mailing address on the attached sheet and fax, email or post it back to me at your earliest convenience. If you are not a grower and would like to get your hands on a copy of this field guide, they should be available through the government book shop shortly.

### Project Leader

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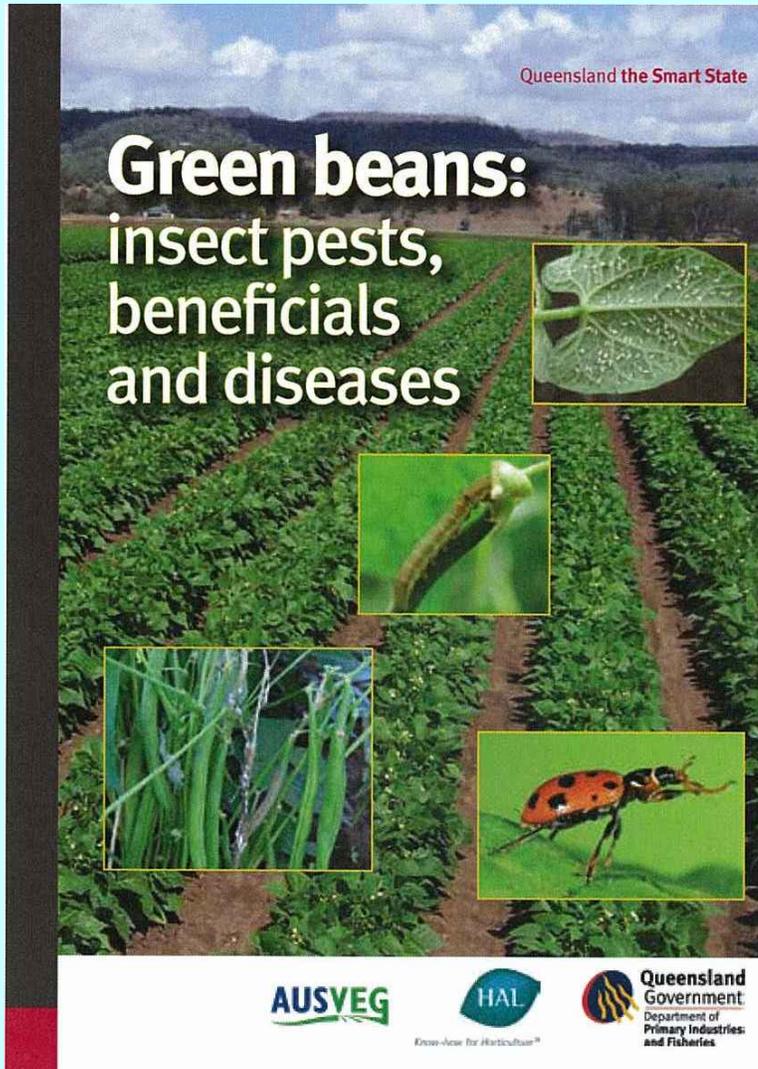


### Project Team Members

John Duff and Carolyn Church



Help us update the 'green beans IPM newsletter' database



My contact details are as follows :-

Name : \_\_\_\_\_

E-mail : \_\_\_\_\_

Fax : ( ) \_\_\_\_\_ Phone : ( ) \_\_\_\_\_

Postal Address: \_\_\_\_\_

\_\_\_\_\_ State : \_\_\_\_\_

Post Code : \_\_\_\_\_ Organisation : \_\_\_\_\_

Green Bean Grower

Consultant

Other: \_\_\_\_\_





# You-beaut ute guide: the bible for green bean growers

With their new ute guide in hand, green bean growers can identify pests attacking their crops and respond in an economical and environmental fashion, writes Angela Brennan.

There is potential for more pests and diseases to affect green bean crops than any other vegetable commodity in Australia. However, growers' pains may be eased with the recent publication of a ute guide, which assists in the prompt identification of pests, diseases and beneficials, and advises a course of action, where appropriate.

The guide, *Green beans: insect pests, beneficials and diseases*, is being sent to growers, and has the potential to become their new bible. It contains more than 200 images, and information about pests, beneficials and diseases. It also includes a simple key to disorders of seedlings, roots, stems, leaves, flowers and pods, and where to find the likely cause of these disorders.

The guide provides a definition of integrated pest management (IPM) and advises growers about crop monitoring—the cornerstone to any IPM system. Information

about pathogens responsible for causing plant diseases is included, as is general information about disease and insect life cycles.

### Extensive research

The national green bean industry is worth about \$65 million annually. Queensland and Tasmania dominate the market with around 40 per cent each in the fresh market produce and process industry, respectively. The fresh market produce and process industry. However, growers lose hundreds of thousands of dollars each year in unsaleable crops due to losses from pests and diseases.

Research into IPM against the myriad invaders attacking green beans has been conducted for a number of years (see *Vegetables Australia* 1.6, page 20). This earlier project centred on developing an IPM system suitable for the green bean industry in the face of

increasing insecticide resistance and access to only a small range of effective insecticides, which limited the level of insect pest control achieved by growers.

On the strength of this project an extension was granted. This enabled the team to complete its work with the production of the ute guide and further research into the complex problem of thrip management.

"Traditionally, growers have relied on heavy insecticide use to control the most common pests," said John Duff, Senior Plant Protectionist at the Queensland Department of Primary Industries and Fisheries, who compiled the ute guide with a team of researchers.

"However, very few insecticides are registered for green beans, so our original research focused on alternative approaches. We did on-farm and research-station trial work to compare conventional pest management systems with

#### Best Management Options (BMO)."

These options included modified cultural practices, soft option insecticides, insect monitoring, augmentation of beneficial insects where possible, and modified pesticide application techniques.

John described the results as variable, but said they demonstrated that growers don't need to spray just because they see an insect flying within their crop.

"We found we were able to

and select soft option or biological insecticides as a first option, then beneficial insects will build up, helping growers manage their insect pest problems with much less cost in the long-term."

#### Elusive thrips

Although the guide covers an extensive range of pests, some, such as flower thrips, continue to slip through the net. "We're not out of the woods yet," said John.

"Thrips are a particularly

thrips, western flower thrips, tomato thrips and plague thrips.

"Part of the problem, particularly in Tasmania, is confusion about whether damage is caused by 'wind scorch' or thrips, both of which can have a very adverse impact on Tasmania's processing industry," he said.

John's team is conducting insecticide efficacy trials in both Tasmania (with Agronico Research) and Queensland, comparing new sap-sucking insecticides with the traditionally used products.

"We hope that alternative products show some promise. In Queensland, growers tend to use traditional broad-spectrum insecticides, which are very disruptive to an IPM program," he said.

"In Tasmania, growers currently don't use any insecticides for thrip control at flowering, which can potentially lead to the entire crop being rejected by the processor."

John added that if alternative products are found that help in the management of thrips,

most growers would consider using these new products when they are registered for green beans use. 

#### THE BOTTOM LINE

- A ute guide has been produced for growers involved in the green bean industry.
- The guide will help growers identify pests, diseases and beneficials, and advise on a course of action, where appropriate.
- Thrip control in the green bean industry is a more complex issue, and trials are being conducted in Queensland and Tasmania to find efficient ways of dealing with this pest.

For more information contact:  
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 Email: <john.duff@dpi.qld.gov.au>  
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 levy-payers  
 Project numbers: VG02030, VG06016  
 Keywords: Green bean Industry

**“We were able to halve the use of some insecticides, which has the benefit of cutting costs and improving yields.”**

halve the use of some insecticides in certain situations, which has the benefit of cutting costs and improving yields," he said.

"I cannot see a time when we won't use insecticides, but if we can minimise the old 'kill everything in the paddock' approach,

difficult pest to manage. It is a big issue for growers, with very few insecticides fully effective against the suite of species that can be found in bean flowers."

Up to 10 different thrips have been identified in green bean flowers, including bean blossom



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## Appendix 3

### Green beans Ute Guide Survey request

As part of the final report that I am compiling for the project that the Green Bean Ute Guide originates from, I have to undertake a survey of recipients of the publication to ascertain if the publication was worthwhile to the industry.

I would greatly appreciate it if you could help me finalise this project report by taking the time to complete the survey below and add comments where indicated. Circle the rating that is the most appropriate.

**Content:** using the rating scale below, was the overall content of the ute guide useful to you or not very useful?



**Quality of information:** rate the following by circling your response.

#### **Page layout**



#### **Adequate information on each insect or disease**



#### **Colour images**



**Adequate illustrations/images:** were there sufficient illustrations and images for you to identify the various problems you encounter in your green bean crop?

Yes                  No

If not then what else would you like to have seen added?

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Answer the next 3 questions by ticking the box on whether you felt there was a complete list of the insect pests and diseases as well as the beneficial insects that you find in green bean crops.

**Was there a comprehensive list of insect pests**

Yes                  No

**Was there a comprehensive list of beneficial insects**

Yes                  No

**Was there a comprehensive list of plant pathogens**

Yes                  No

What insect pest, beneficial insect or plant disease do you feel was missing from the ute guide?

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**Rate the following by circling your response:**

**Key to Green Bean Disorders (page xxiv)**



**Glossary (page xxi)**



**Durability of book**



**Overall length**



**Impact of pesticides on beneficial insects (pages 170 and 171)**



**Other comments**

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Please Reply by the 14<sup>th</sup> November 2008.

Attention: John Duff

Fax number (07) 54623223

or

Email: [John.Duff@dpi.qld.gov.au](mailto:John.Duff@dpi.qld.gov.au)