

Growing Strawberries Sustainably Using the New IPM Model

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The traditional integrated pest management (IPM) model is based on maintaining ecological balance in the cropping system with some attention to pest management costs in relation to yield losses. The new model is expanded to cover the management, business, and sustainability aspects of pest management and discusses various components within. According to this model, IPM can be defined as an approach to manage pests in an economically viable, socially acceptable, and environmentally safe manner (Dara, 2019 - <https://academic.oup.com/jipm/article/10/1/12/5480541>).

Here is how the new IPM model can be used for producing strawberries sustainably.

1. MANAGEMENT ASPECT

A. Pest Management: The term “pest” includes arthropod pests, diseases, and weeds.

- Select varieties that produce good yields while resisting biotic and abiotic stresses.
- Choosing the right mulch, and good irrigation and nutrient management can help address pest issues. Micro-sprinklers save water and hold pest management benefits.

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- Explore the potential of beneficial microbes and biostimulants to improve nutrient and water absorption and to maintain crop health. Inoculate the transplants with biostimulants to induce systemic resistance and periodically apply, especially after fumigation, to improve the beneficial microbial activity in the soil.
- Healthy plants resist pest problems and reduce the need for control options. Plant health can be maintained through good cultural practices (biostimulants, nutrients, irrigation, soil conditioning, etc.).
- Predatory mites effectively control twospotted and Lewis mites, but natural enemy populations may not be sufficient to control the western tarnished plant bug.
- Light traps can be useful for managing lepidopteran pests.
- Vacuums can be a part of the IPM program for managing the western tarnished plant bug.
- Use botanical, microbial, and chemical pesticides in combination.

B. Knowledge and Resources:

- Understand pest biology, vulnerable stages of the pest, and appropriate strategies for each pest, different life stages, season, and budget.
- Accurately identify the issue through visual observation or laboratory diagnosis for proper corrective action.
- Try to explore modern technology to monitor crop health.

C. Planning and Organization:

- Regularly monitor crop health for early detection and prevention of potential pest problems.
- Maintain records of pest occurrence, seasonal trends, strategies that worked, and all relevant information, to build institutional knowledge for future use.
- Take the right action at the right time.

D. Communication:

- Regularly attend extension events and read research updates. Choose or design practices that are ideal for your farm.
- Periodically provide training to all individuals on the farm who directly or indirectly contribute to good agriculture practices.
- Share good management practices with each other for area-wide improvement of crop production and pest management.
- Try to educate the public so that they make better choices when purchasing produce.

2. BUSINESS ASPECT

- A strong IPM program can help growers produce sustainably while ensuring profitability.
- Consumer choices depend on their knowledge of sustainable agriculture. When they understand that produce with an IPM or Sustainably Produced label is safe for human and environmental health, it will have a major impact on food production systems.

3. SUSTAINABILITY ASPECT

- The current interpretation or perception of sustainability does not reflect true sustainability in terms of environmental health, profitability, food security, social equality, and other elements. A good IPM model can address all these issues to ensure farm productivity, food affordability, and environmental safety.

RESEARCH and OUTREACH

- Research and outreach component is the foundation of IPM to identify pest issues, develop appropriate knowledge for their management, and effectively disseminate the related information. Supporting research and outreach efforts of universities and other entities is essential for continuing IPM.

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References

In addition to the below references, there are several articles at <https://ucanr.edu/JEB> on crop production and protection of strawberry.



◀◀Download “Biology and management of spider mites in strawberry” in English and Spanish at <http://ucanr.edu/spidermiteguide> or scan the QR code. Information about different species of spider mites and predatory mites is available in this guide.

Efficacy of botanical, chemical, and microbial pesticides on twospotted spider mite and their impact on predatory mites

<http://ucanr.edu/blogs/blogcore/postdetail.cfm?postnum=18553> ➤➤



◀◀Entomopathogenic fungi can endophytically colonize strawberry plants when applied to the soil and negatively impact twospotted spider mite infestations

<http://ucanr.edu/blogs/blogcore/postdetail.cfm?postnum=16821>

How to detect resistance to miticides in twospotted spider mite populations and strategies to reduce the resistance development

<http://ucanr.edu/blogs/blogcore/postdetail.cfm?postnum=22097> ➤➤



◀◀Comparison between the twospotted spider mite and the Lewis mite

<http://ucanr.edu/blogs/blogcore/postdetail.cfm?postnum=5771>

An overview of lygus bug biology, damage, and management in strawberries

<http://cesantabarbara.ucanr.edu/files/75473.pdf> ➤➤



◀◀Lygus biology, monitoring, and management videos

<http://ucanr.edu/SDYouTube>

Fruit deformity in strawberry from lygus bug and other factors

<http://ucanr.edu/blogs/blogcore/postdetail.cfm?postnum=19630> ➤➤



◀◀Potential of a solar-powered UV light trap as a pest management

option in strawberry <http://ucanr.edu/blogs/blogcore/postdetail.cfm?postnum=25307>

IPM tools for controlling western tarnished plant bug in strawberry

<https://ucanr.edu/blogs/blogcore/postdetail.cfm?postnum=19641> ➤➤



◀◀ Entomopathogens (pathogens of insects, mites, and ticks), their modes of infection, and how they can be used as a powerful tool in IPM

<http://ucanr.edu/blogs/blogcore/postdetail.cfm?postnum=24119>



Biopesticides and IPM

<https://ucanr.edu/blogs/blogcore/postdetail.cfm?postnum=25912> ➤➤

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◀◀ Lygus bug and natural enemy populations in organic and conventional strawberries
<https://ucanr.edu/blogs/blogcore/postdetail.cfm?postnum=14030>

Microbial and bioactive soil amendments for improving strawberry health and yields
 (2017-2018 study)

<https://ucanr.edu/blogs/blogcore/postdetail.cfm?postnum=27891> ➤➤



◀◀ Beneficial microbe-based products for strawberry health and yield (2016-2017 study)
<https://ucanr.edu/blogs/blogcore/postdetail.cfm?postnum=25122>

Beneficial microbes and entomopathogenic fungi for strawberry health and yield
 (2015-2016 study)

<https://ucanr.edu/blogs/blogcore/postdetail.cfm?postnum=22709> ➤➤



◀◀ Entomopathogenic fungi antagonizing *Macrophomina phaseolina*
<https://ucanr.edu/blogs/blogcore/postdetail.cfm?postnum=28274>

Entomopathogenic fungi and other biologicals against *Fusarium oxysporum*
<https://ucanr.edu/blogs/blogcore/postdetail.cfm?postnum=22199> ➤➤



◀◀ Micro-sprinklers in strawberry
<https://ucanr.edu/blogs/blogcore/postdetail.cfm?postnum=19699>

UCANR eJournal of Entomology and Biologicals <https://ucanr.edu/JEB> ➤➤



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eJournals: <http://ucanr.edu/JEB> and <http://ucanr.edu/pestnews>

Meeting presentations: <http://ucanr.edu/meetingpresentations>

Meeting handouts: <http://ucanr.edu/meetinghandouts>

Educational videos: <http://ucanr.edu/SDYouTube>

Illustrated strawberry production manuals: <http://ucanr.edu/strawberrymanual> in English and Spanish

Spider mite management guide: <http://ucanr.edu/spidermiteguide>

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