



Agriculture & Horticulture
DEVELOPMENT BOARD



Grower Summary

SF 114

Development of temperature degree-based models to predict pest development on strawberry for optimisation of control strategies

Annual 2012

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Use of pesticides

Only officially approved pesticides may be used in the UK. Approvals are normally granted only in relation to individual products and for specified uses. It is an offence to use non-approved products or to use approved products in a manner that does not comply with the statutory conditions of use, except where the crop or situation is the subject of an off-label extension of use.

Before using all pesticides check the approval status and conditions of use.

Read the label before use: use pesticides safely.

Further information

If you would like a copy of the full report, please email the HDC office (hdc@hdc.ahdb.org.uk), quoting your HDC number, alternatively contact the HDC at the address below.

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HDC is a division of the Agriculture and Horticulture Development Board.

Project Number: SF 114

Project Title: Development of temperature degree-based models to predict pest development on strawberry for optimisation of control strategies

Project Leader: Prof Xiangming Xu, Dr Jean Fitzgerald

Contractor: East Malling Research

Industry Representative: Harriet Duncalfe

Report: Annual Report 2012

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Previous report/(s): Annual Report 2011

Start Date: 01 April 2011

End Date: 31 March 2013

Project Cost: £78,993

Headline

- Models for predicting development of tarsonemid mites and strawberry blossom weevils have been developed.

Background and expected deliverables

Strawberries are very susceptible to many pests, including European tarnished plant bug, strawberry blossom weevil, western flower thrips, aphids and tarsonemid mite. Some developmental stages of pests may be more susceptible to insecticides than others; information on when the most susceptible stages are present would enable more effective pesticide targeting. For pests in general (unlike diseases), the developmental rate is mostly related to temperature; mathematical models are used to describe such temperature-developmental-rate relationships.

Diapausing adults of European tarnished plant bugs (capsids) overwinter on weeds or crop debris. In the UK, the first generation of the pest is believed to develop on weeds, and adults from this generation disperse into strawberry where a second (and possibly a third) generation occurs. The dispersal into strawberry has generally been at the time of flowering of everbearer strawberries. Recent observations, however, suggest that capsids may disperse to and cause damage to many other crops, including June-bearer strawberry, raspberry and blackberry, at much earlier times than previously reported, possibly because of warm winters and springs.

A current Hort-LINK project HL0191 (SF 94) is focusing on the development of a holistic integrated pest and disease management (IPDM) system for production of strawberries which does not rely on intensive use of fungicides and insecticides during flowering and fruit development. In a separate Hort-LINK project HL1107 (SF 120), a model for predicting western flower thrips development is also being developed.

There is one key expected deliverable from this project:

1. A model forecasting capsid development on strawberry developed and ready to be used by growers (together with models for other strawberry pests and diseases).

Summary of the project and main conclusions

Models have been developed which predict the phenology of strawberry tarsonemid mite and blossom weevil and incorporated into a computer programme that already contains models for strawberry grey mould, powdery mildew, western flower thrips and capsids. All pest models need to be further improved, especially in relation to pest development in early spring.

New biological data on capsid development have been obtained in order to improve the capsid model. Regular sampling for the pest in weeds and strawberry fields has provided more information on the development of the pest related to temperature; these data will be used for validation of the model.

Financial benefits

It is too early to identify any financial benefits emanating from this project.

Action points for growers

No action points have arisen from this work so far.