A Living Biopesticide Against the Insect Pest, Spotted Wing Drosophila

Tech ID: 25711 / UC Case 2016-193-0

ABSTRACT

Researchers at the University of California, Davis have developed a biopesticide in the form of transgenic yeast that, once ingested, causes reduction in reproductive output and mortality in spotted wing drosophila, a major agricultural threat to fruit crops worldwide.

FULL DESCRIPTION

Spotted wing drosophila (Drosophila suzukii) is a major threat to cherry and other fruit crop production and is attributed to millions of dollars in economic losses due to fruit crop damage. Left untreated, these losses could dramatically increase as populations of the spotted wing drosophila grow and spread. With the need to satisfy insect damage standards and to reduce crop loss, growers generally adopt high levels of insecticide usage for risk reduction and pest control. Chemical pesticides can be extremely effective in controlling pest populations, however, the drawbacks are that they are usually non-specific, so all organisms, even beneficial ones such as honey bees, are affected. Chemical pesticides can also contaminate water supplies and damage ecosystems. Moreover, continued use of pesticides will eventually lead to development of pesticide resistance in target insects, rendering the insecticide ineffective. To ensure sustainability of crop production and provide an alternative approach for spotted wing drosophila control, there is a need for more environmentally friendly, economical, and species-specific biopesticide that targets spotted wing drosophila.

Researchers at the University of California, Davis have developed a biopesticide that uses transgenic yeast as a vector to deliver double-stranded RNA ("dsRNA") to knock down genes that are critical for survival in spotted wing drosophila. Yeast is a part of the natural diet and an attractant for spotted wing drosophila, and flies will naturally seek it out and consume. Double-stranded RNA can be designed to be species specific and, unlike conventional insecticides, will not affect beneficial insects. Additionally, growers will not need to change crops to transgenic varieties as in other plant engineering technologies that use dsRNA. If successful, this technology can be extended to target other insect pests and have broad impact in fruit crop production.

APPLICATIONS

- Pesticide against spotted wing drosophila

FEATURES/BENEFITS

- Environmentally friendly, economical, and species-specific for spotted wing drosophila
- Alternative approach to chemical pesticide
- No contamination of water supplies or damage to ecosystems

RELATED MATERIALS

CONTACT

Eugene Sisman
esisman@ucdavis.edu
tel: 530-754-7650.

INVENTORS

- Chiu, Joanna
- Murphy, Katherine A.

OTHER INFORMATION

KEYWORDS

biopesticide, spotted winged drosophila, transgenic yeast, fruit crop damage, agricultural pesticide

CATEGORIZED AS

- **Agriculture & Animal Science**
  - Other

RELATED CASES

2016-193-0

▶ Ingestion of genetically modified yeast symbiont reduces fitness of an insect pest via RNA interference [Scientific Reports 6, Article number: 22587 (2016)] - 03/02/2016

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	11,117,938	09/14/2021	2016-193

University of California, Davis
Technology Transfer Office
1 Shields Avenue, Mrak Hall 4th Floor,
Davis,CA 95616

Tel:
530.754.8649
techtransfer@ucdavis.edu
https://research.ucdavis.edu/technology-transfer/
Fax:
530.754.7620