

Strawberry disease control with heat shock treatment

Production

Demonstration

Item: Strawberry

Chemical pesticide reduction

Outline

Spraying strawberries with hot water (heat shock treatment) once a week during cultivation induces systemic disease resistance in the plant body and suppresses the occurrence of powdery mildew, including fungicide-resistant strains, at a level similar to suppression using agricultural chemicals. Heat is expected to have a direct suppressive effect on other pests and diseases as well.

Background/effect/note

Strawberry cultivation in the main field lasts for more than six months for June-bearing varieties* and for multiple years for everbearing varieties†. Despite long cultivation periods, the use of agricultural chemicals on strawberries is limited to registered formulations, and the application frequency is restricted. In particular, the chemical control of powdery mildew has become difficult because of the emergence of an ergosterol biosynthetic inhibitor (DMI) resistant strain. Heat shock treatment applied by spraying hot water once a week (Fig. 1) can suppress DMI-resistant powdery mildew by inducing systemic resistance, as well as through the direct effect of heat. To obtain the best effect, the strawberry leaves closest to the spray nozzle are treated at 50°C for 20 seconds (Figs. 2, 3). This treatment also has a direct suppressive effect on thrips and aphids. There is no damage to yield or quality if the treatment is applied properly; however, it should be noted that the expected effect is preventive and not curative. In addition, to prevent gray mold due to increased humidity in the greenhouse, the treatment should be applied in the morning on sunny days, and the plants should be dried using ventilation immediately after spraying.

* June-bearing varieties: flower sprouts in short-day conditions and fruiting only in winter and spring.

† Everbearing varieties: fruiting not only in winter and spring, but also in summer and fall.



Fig. 1. Hot water spraying device (Rikuzentakata City, Iwate Prefecture)

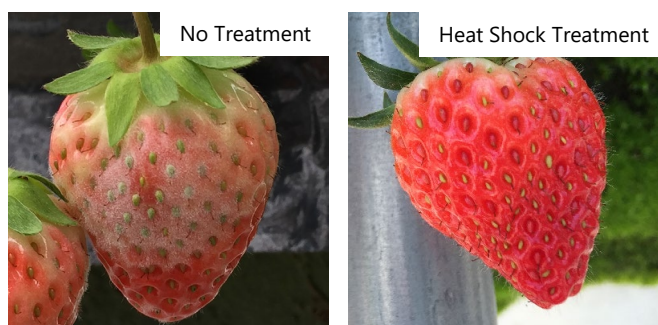


Fig. 2. Effect of heat shock treatment on powdery mildew

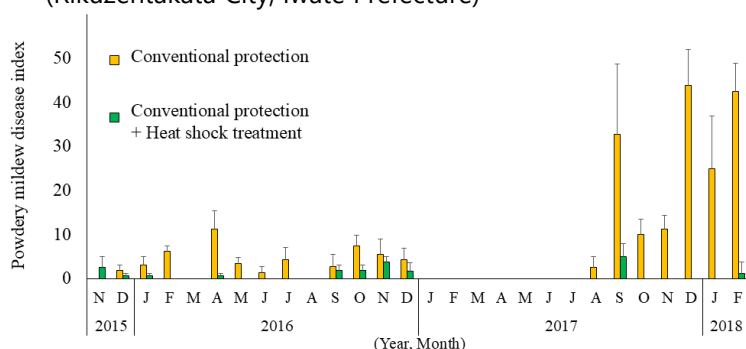


Fig. 3. Effects of heat shock treatment on resistant strain of powdery mildew.

Technical details:



<http://protech.agr.ibaraki.ac.jp/s-ub25.html>

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