Induction of Systemic Acquired Resistance by a Natural Inducer in Strawberry

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Summary

Induction of resistance to anthracnose by a natural inducer of systemic acquired resistance (SAR) was evaluated in the greenhouse and field. The inducer did not provide pretection against anthracnose in both the greenhouse and the field. Future work will optimize the treatment conditions and determine the effect on other strawberry diseases.

Methods

***Colletotrichum acutatum* and *C. gloeosporioides* preparation.** Four pure cultures of each pathogen were maintained on potato-dextrose-agar for 6 to 8 days at 24°C. A conidial suspension (1 x 10^6 conidia mL^{-1}) was prepared for each isolate, and the four suspensions were then combined. The isolates were collected from crowns, petioles, or fruits of strawberry plants grown in the field or greenhouse in Florida.

Greenhouse test. Strawberry plants were treated with 10 mM NAD^+ by foliar spraying or soil drenching. Two days later for foliar spraying and 4 days later for soil drenching, the plants were inoculated with *C. acutatum* or *C. gloeosporioides*. Inoculation was performed by spraying 2 to 3 mL of conidial suspension onto the crown and canopy of five NAD^+-treated and non-treated (control) plants per treatment using an atomizer. The plants were kept under high humidity. Incidence of anthracnose was scored as the number of individual plants showing symptoms 20 days post-inoculation. For crown rot, disease incidence was determined by the number of plants that collapsed 20 days post-inoculation.

Field test. Plants were treated similarly as in the greenhouse. Foliar spraying and soil drenching were applied 3 and 7 days, respectively, before inoculation by 10 mL of conidial suspensions of *C. acutatum* or *C. gloeosporioides*. Disease incidence was determined from the field harvest (2 harvests per week for 3 weeks after inoculation). Crown rot caused by *C. gloeosporioides* was continuously monitored in the field.

Results

Greenhouse experiment. The greenhouse experiment did not produce good data because there was no disease on the inoculated plants for a long time until the mist in the greenhouse was turned on to enhance the disease development, which was two months after NAD^+ treatment and pathogen inoculation. After the mist was turned on, anthracnose fruit rot and crown rot started to show up. However, there was no difference in disease incidence between NAD^+-treated plants and the non-treated controls. The greenhouse experiment will be repeated in the next growing season.

Field experiment. As shown in Fig. 1, there was no difference in anthracnose fruit rot incidence between the NAD^+-treated plants and the non-treated controls, although the higher disease incidence was observed on plots with soil drenching. For crown rot caused by *C. gloeosporioides*, no disease in the field has yet been observed, since the pathogen requires a longer period of time to produce symptoms.

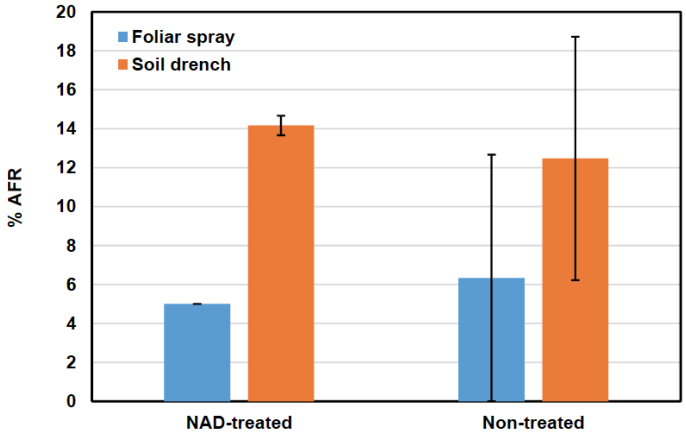

Figure 1. The effect of NAD^+ on anthracnose fruit rot (AFR) (caused by *C. acutatum*) development under field conditions.

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