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Does a green light-emitting diode help *Neoseiulus californicus* for spider mite control on strawberries?

Abstract

We used green light-emitting diode (LED), the Midorikikuzo™ in strawberry in order to observe its effect on control of the two-spotted spider mite, *Tetranychus urticae*. We used the predatory mite, *Neoseiulus californicus*, and chemical acaricides. Under high density of spider mite, density of spider mite is seemed to be lower in green LED plot than the control.

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What is the Midorikikuzo™?

Shikoku Research Institute Inc. developed the Midorikikuzo™ which is green light-emitting diode (LED) device for agricultural use. Two types, rope-light and bulb, are distributed.

There are four effects on agricultural production:-

*Disease control:

Suppress outspread and occurring by promotion of the resistance to diseases.

Japanese Patent No. 5028407

*Spider mite control:

Suppress damage from spider mites by attracting natural enemies and by promoting them to stay.

Japanese Patent No. 5294326

*Promote growth:

Healthier growth enables the promotion of larger fruit.

Japanese Patent No. 5364163

*Improve quality

Increase content of sugar, Vitamin C (ascorbic acid) and functional ingredients.

Patent Pending

Fig. 1 Green LED, the Midorikikuzo™.

Methods

Midorikikuzo™ was put on from 19:00 to 21:00 on every Monday, Wednesday and Friday.
The number of the spider mite and the predatory mite was counted two times a week.
We treated the predatory mite three times. Chemical acaricides applied by the control threshold of 20% rate of spider mite existing leaves. Total number of acaricide application was eight from January to April 2014.

Results

The number of the spider mite and the predatory mite is shown in Figures 2 and 3.
The spider mite density was lower in green LED plot than the control. The predatory mite density seemed to be larger in green LED plot.

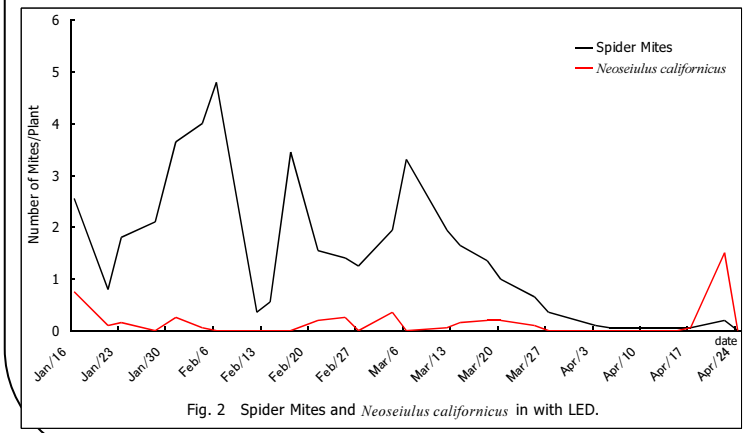

Fig. 2 Spider Mites and *Neoseiulus californicus* in with LED.

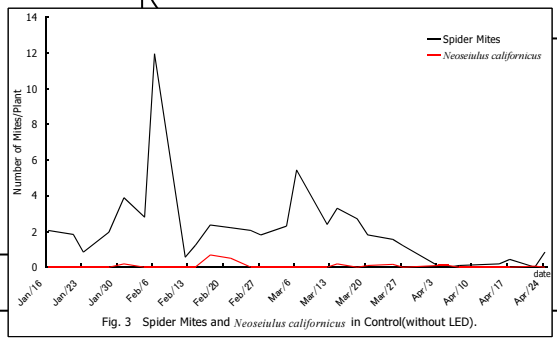

Fig. 3 Spider Mites and *Neoseiulus californicus* in Control(without LED).

Discussion

We conducted this experiment under high density of the spider mite, and we could not make any replication plot due to the plastic house availability.
We think these results suggested the effect of green LED.
In the future, precise evaluation of the effect of green LED would be desired.
The mechanism of promoting the predatory mite activities against the spider mite is also of great interest.

Acknowledgment

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