The Viability of Heat as an Efficient Control for the Varroa destructor Mite

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The increasing number of varroa mite sightings has become a huge problem as approximately 80 percent of food crops rely on pollination. Even under chemical treatment, both labor intensive and stressful, the produced honey is harmful to the bees or can ruin the honey making process by reducing the lifespan of the bees, and are known to spread viruses such as Sacbrood, Deformed Wing Virus, Black Queen Cell Virus, and Acute Bee Paralysis Virus. All of which are deadly to bees. [1]

Varroa mite infestation has started. [2] The increasing number of varroa mite sightings has become a huge problem as approximately 80 percent of food crops rely on pollination.

Chemical treatment is the most common form of treatment, however most of the available chemical treatments are either harmful to the bees or can ruin the produced honey.

Powdered sugar is a harmless method killing varroa mites, but this method is only 40% effective.

Heat is becoming an ideal method, because bees have a relatively high heat tolerance compared to the varroa mite. One method that has been tested is using heat to remove frames individually for incubation[4], but this method is both labor intensive and stressful to bees.

Another heating method developed involved placing large amounts of bees in an oven, but this method was also labor intensive and easily harmed bees.

Future Work

We intend to further this concept by engineering a ceramic build for drone frame that is physically resistant to extreme temperatures, Feedback systems to regulate energy output and reduce waste, Printed circuitry to reduce environmental risks and, A plug-and-play interface to simplify operation of drone trapping systems.

References


Image Citations


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