



Manufacture of Pesticides using Local Herbs

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Introduction:

Natural pesticides resulted from natural herbs and organic substances usually do not affect the ecosystem. Ecosystem is the interaction between biotic and abiotic component.

Biotic component are the living components in the environment. They can either be population or community.

Many farmers will not use synthetic pesticides, and some consumers will only buy organic produce. Mass production farms rely on synthetic pesticides, however, because they are cheaper than organic ones. When farmers used pesticides such as DDT and malathion, there was little understanding of how dangerous and long-lasting these chemicals are. It was only later that the degree to which these pesticides remain in the environment was discovered (Carson). Organophosphates designed to affect the brain and nervous system of insects, sometimes damage those of humans and animals.



students applying neem pesticides in the garden

Method:

Neem pesticides

I produced natural pesticides from neem tree (*Ozoneem trishul*), green chili (*Capsicum annum*) and garlic (*Allium sativum*). Research has shown that garlic and chili peppers successfully repel insects. I chose to conduct new research with neem tree because it is a hardy coniferous tree that has natural defenses against insects, like its relative the cedar, whose wood repels moths. **Neem tree leaves**

we tested our insecticides, each at three concentrations, on populations of greater wax moth larvae (*Galleria mellonella*), or what we called the "worms." The medium and lowest concentrations were diluted 3:1 and 5:1 from the fully concentrated solution. we created ten populations of 20 moth larvae each. After allowing the larvae time to get used to their environment and eliminate natural deaths, we sprayed each population with the natural insecticide. Thereafter, we tracked their survival rates.

To prepare the neem pesticide, we cut off 200g of tree leaves, chopped them up in a food processor and added one liter of distilled water. It was important that there was nothing in the water that might affect the pesticide. we concentrated it by boiling to extract the substances from the leaves, and strained out the sediment. we did the same with 400g of peeled garlic cloves and 250g of green chilies. By weighing out a cup of each, we calculated the concentration of plant substances per liter of solution.

Preparing the Habitats

Moth larvae habitats we divided food among the 10 habitats, and placed 20 moth larvae in each. After four days, we sprayed the moth larvae with the insecticides. we calculated how many milliliters per spray by counting the "pumps" to fill 50ml. The worms received the following amounts of each insecticide: 18ml garlic, 19ml neem pesticides and 11ml green chili. The moth larvae received less of the green chili pesticide, leading us to believe that it is potent in even lower concentrations than the other two substances.

Every day we tracked the numbers of dead and live moth larvae on a chart, as well as the escapees. mortality of the population for each concentration of the insecticide and for the control group through . we analyzed (1) the mortality rate (how many died on each day), (2) how many days were needed to achieve lethality to 50% of the population, or LD 50, which is the standard used when testing commercial products, and (3) total mortality after 15 days. we sprayed the control group with water to rule out the possibility that spraying (or poor care) contributed to deaths.



Results:

Neem pesticide can be in two form which are in juice forms and in oil form.

In juice form you extract juice from the leaves then you spray immediately and generously on the affected areas but the juice should mixed with water before sprayed. In oil form you extract neem oil from its seeds add teaspoon of detergent and warm water then shake well then spray.

Neem pesticides exhibits various behavioral responses eg antifeedant, feeding deterrent, repellent, physiological responses such as growth inhibitor, reproduction inhibitor anti fertility and it disrupts the metamorphosis of insects larvae

Conclusions:

The control group did not have deaths until Day 11, six days after spraying, while all of the other groups had deaths starting in Days 6-8, two to four days after spraying. The final mortality in the control group was only 30%, while the other groups had a final mortality of 65% to 95%. I concluded it was mainly the insecticides that killed the worms.

The highest concentrations of all of the insecticides caused mortality within one to three days of spraying . With the chili and neem pesticides, mortality was observed after the first day.

The neem leaves was the most lethal, killing 95% of the worms by Day 15, or 10 days after spraying. The garlic and killed 75% to 80% by Day 15. At full strength, all three pesticides achieved 50% mortality by Day 10, five days after spraying.

The Eastern hemlock at full strength and diluted 3:1 worked nearly the same, with five days to 50% mortality for both, and the same final mortality of 75% . When diluted 5:1, the neem leaves was almost as effective, with a final mortality of 60%. This makes us think that we could have diluted it further.

References:

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