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# Fighting pests in organically produced vegetables

People have often associated organically-grown salad greens with healthy eating. And since leafy greens and vegetables are eaten fresh, ensuring their quality is vital both for farmers and consumers.

Health-conscious as they are, consumers want their salad vegetables fresh and clean, and with fewer holes, creases, and wilt.

This applies to farmers too. Quality is an important measure in selling vegetable produce. Even if a farmer is selling organically-grown vegetables, if it's not of good quality, he won't be able to command a high price.

A major constraint to growing organically-produced salad vegetables is insect pest infestation resulting to a major reduction both in yield and quality of the crops.

In organic farming, a widely accepted method to control pest infestation is through botanical spraying. But this was proven to be lacking as well, if not ineffective in some cases. Various approaches and techniques are being tried in combination with the spraying of botanicals and plant concoctions to make it more potent against pests.

One technique that is currently being tried by a group of researchers from the Cebu Technological University (CTU)-Barili campus is the use of entomopathogenic nematodes (EPN) to control pest infestation in organically-produced salad vegetables.

The project, "Identification of Indigenous Entomopathogenic Nematodes as Effective Biological Control Agent Against Common Insect Pests of Selected Organically-Grown Salad Vegetables in Cebu," was funded by the Bureau of Agricultural Research (BAR) through its National Organic Agriculture Program.

Co-project leader Pet Roey Pascual said EPNs are soil-borne microorganisms that feed on their host. They are microscopic and look like threadlike worms that invade in the host insects through natural body openings like anus and mouth.

Once inside the host, they release a symbiotic bacterium, which is held in the nematode's intestine killing the host within 24-48 hours. These EPNs rapidly feed on the host cadaver, disintegrating its tissues until it is totally dispersed and gone. This particular characteristic makes them an excellent potential biocontrol agent against vegetable insect pests.

* PESTICIDES
* VEGETABLES

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Since EPNs are found in soil, they serve as a good indicator that the soil is in good condition. "Naturally, if the soil is in good condition, it is less exposed to inorganic chemicals, then there is a bigger chance that we can get EPN," Pascual said.

Pascual added that EPNs possess a unique combination of attributes such as broad host range, high virulence, long term efficacy, easy application, easy mass production, compatibility with most chemicals. They are also environmentally safe which make them ideal components of insect pest management system.

EPN is one technology that has been available for some time. In fact, advanced countries like the United States and Europe have already been using it for quite a while.

"Even in Asian countries like Korea and Thailand, they are also using EPN to control insect pests in vegetables. In the Philippines however, this method has not been fully tapped and optimally tried by our farmers. And this is mainly due to lack of awareness of the farmers on the technology. If we can bring this technology to the knowledge of the public, particularly those who are into organic farming, then more people will benefit from it," Pascual said.

"We want to promote EPN in combination or in complementation with other existing technologies such as the use of IMO, wood vinegar, organic mulching, vermicomposting, etc. Most farmers are already practicing either one or two of these organic pest management systems, but if partnered with EPN, which they can just apply once or twice a month, then it will be less laborious but more effective," he said.

Results of the study showed that when tested under greenhouse condition, two to four cadavers are effective in controlling insect pests but if combined with wood vinegar, two cadavers will be enough and effective.

Meanwhile, when tested in the field, results found that EPN is effective if partnered with wood vinegar.

For organic fertilization, EPN is effective if combined with composted cow manure. It was also found effective in combination with microbial inoculants.

However, using mulching in combination with EPN was not found as effective as the others because the population of the nematodes declined due to their immobility in the covered soil.

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If EPN is used in combination with other existing cultural management practices, results of the leaf damage using VQR (visual quality rating) showed there would be less 50 percent leaf damage in the plant. This means it is 50 percent better if farmers use EPN rather than no management practice is applied.

"The leaves are cleaner, with fewer holes so farmers can market their produce at a relatively higher price. At the same time, consumers are assured since the produce are organically-grown therefore free from any harmful chemicals and are safe to eat," Pascual said.

Pascual said they want to train more farmers on the EPN technology. "We want more farmers to be aware of this technology and use it to profit them," he said.

– Rita dela Cruz