Module 5: Make room for the worm

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objective

- Learn about worms and their benefits
- All things pest and plants

The casting that worms leave behind easily dissolve in water the coatings that are released from the worm release nutrients into the soil after they consume grains and other nutrients. The nutrients are then time released into the soil and this is why the worm is our friend. Castings of earthworms have bested , and the results show that they contain significantly higher concentration of nutrients than bulk compost. The use of chemical fertilizers is a one apply and release job the plant makes use of what is readily available, and the excess leaches away into the soil, beyond the plant's ability to access it. Additionally, chemical fertilizers are the leading cause of water pollution in our water systems .

Nitrogen, phosphorus, and potassium are the elements represented by the acronym N-P-K. There are three essential components that are essential for the development of plants. Nitrogen encourages quick plant growth, increases seed and fruit production, and enhances the quality of the plant's leaves. Phosphorus is essential to the growth of both flowers and roots. Potassium has an important role in the manufacture of protein, as well as the process of photosynthesis, the resistance to illnesses, and the general health of plants. These are vital for the growth of the plant, but they are not the only type of nourishment that is required for plants to thrive . Earthworms help create humus a dark brown soil that holds important nutrients they help in creating good soil structure and are rich in NPK. Adding rotted compost chopped leaves or grass clippings will encourage earthworms to visit your garden. Remember worms are our friends so make the area inviting so they can show gratitude by leaving nutrients all over your areas.

Worms and Decomposers

Worms are unique and important members of the group of organisms that feed on decomposing or rotting organic waste. Decomposers are the name given to these organisms. The question now is, what exactly do these decomposers perform, and why are they so vital? These organisms are an essential part of the food chain in the environment. They are the ones that are responsible for breaking down the organic and nutritional matter that is left behind by deceased species. As a result, they recycle organic matter and make it available to the ecosystem.

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These vital components are reintroduced into the food cycle as a result of the organic and nutritional matter being absorbed or taken up by the plants or other producers in the ecosystem. The interaction between decomposers and the ecosystem looks like this. However, despite their position at the very bottom of the ecological pyramid, decomposers are an essential component of the foundation upon which the life that lives higher up is built. Decomposers are called heterotrophs because they get the nutrients and energy they need to live from the things they break down.

There are numerous advantages to gardening in your own backyard; however, there is one vexing disadvantage: the presence of unwanted pests and diseases that may harm your lovely plants and delectable home-grown vegetables. Although these assaults do not typically result in the death of the plant, keeping a close eye on your garden on a regular basis will alert you to any issues as soon as they arise, allowing you to head them off before they cause significant harm. These are some of the most frequent diseases and vermin.

• The presence of cabbage worms can be identified by the presence of tell-tale holes in the leaves of the cabbage. Adults should be removed by hand, and the undersides of the leaves should be examined for eggs.

• On the undersides of these leaves, where squash bugs lay their eggs, nymphs are developing from squash bug eggs. Take off any leaves that are infected and search for adults.

• Tomato hornworms are the larval stage of the five-spotted hawk moth, which is also known as the five-spot hawk moth. The adult and the immature phases of this insect are both frightening to look at, but the hornworm is a pest that should be avoided in the vegetable garden.

• Whiteflies get their nutrition from the plant liquids they siphon out with their mouthparts. They have the potential to bring about wilting, stunting, and even death.

• Wireworms are quite abundant in the majority of different types of soil and can be found at any time of the year. If wireworms eat the roots of plants, such plants will have stunted growth and will be susceptible to disease. Because wireworms are so widespread, it can be very challenging to get rid of them.

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• Cucumber beetles are responsible for the transmission of a bacterial illness known as bacterial wilt. Cucumber beetles feed on roots, leaves, and blossoms. In most cases, the plants can recover from the injury without being killed, although the loss of blossoms results in fewer fruits being produced. The bacterial wilt can quickly spread, which can result in fatalities. It starts on just one leaf and quickly spreads throughout the plant.

• Usually, a mosaic virus can be identified by the mottled yellow appearance of the leaves. To stop the virus from spreading, infected plants should be taken out of the ground and thrown away as soon as possible.

Organic methods of pest and disease control

Weed control, weed prevention, organic insect control, and plant disease control are all components of effective organic pest control and management, and each of these components relies on a specific strategy. These control methods can be either preventative or reactive, and they can each be split down into their own unique set of four tactical categories, which are cultural, mechanical and physical, biological, and chemical. These strategic categories have been arranged on purpose, from least detrimental to the environment to those that are most likely to cause damage to biological ecosystems. The least destructive category is at the top of the list.

1. **Cultural command**

Cultural control methods are some of the oldest ways of preventing and removing pests, and they start with the way that you, the producer, go about your gardening job. There is widespread consensus among qualified horticulturists that cultural control strategies are the most effective means of preventing plant diseases. Before, during, and after the process of seeding or transplanting your plants, you can use these strategies to avoid and/or reduce the number of pests, weeds, and diseases that may affect them. Control methods that fall under this category are diverse and encompass a wide range of topics. Some of these topics include managing soil fertility, companion planting, crop rotation, selecting plant species, weeding, pruning procedures, and equipment cleaning. This entry in the column is in no way meant to be all-inclusive; cultural control methods can range in thousands of different ways based on the grower's environment, climate, soil type, and individual crop, to name a few of the variables.

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2. Controls that are Mechanized and Physical

Incorporating natural methods of pest management into your growth strategy is a good place to start, but growers also have access to a variety of man-made choices for keeping pests at bay in their operations. The elimination of pests can be accomplished by the utilization of mechanical and physical controls, which involve the application of physical items and technologies. These mechanisms can take the form of screens, obstacles, fences, traps, and mulches, all of which can come in a wide range of dimensions, classifications, and kinds. This wide variety of devices can include things like deer fences, chicken wire, insect screens, bird nets, shade cloth, plastic mulch, and any other suitable defence mechanisms that are designed to prevent the entry of pests that are after your plants. A floating polyester row cover is a manufactured good that, when applied in the appropriate manner, can serve as a line of defence against a variety of environmental stressors. The material is so thin that it allows rain, water, sunlight, and gas exchange to pass through it to your crops. At the same time, however, it prevents the loss of heat and the entry of a wide variety of insects and microbiological pathogens. It's possible that physically controlling pests around your growing areas will require luring them into traps and then killing them. A garden supply stores, you can find many different kinds of traps, such as sticky traps, coloured traps, pheromone traps, trigger traps, light traps, and different kinds of varmint traps that are made to catch and/or kill small animals.

3. Biological Containment

Biological controls are an alternative to chemical pesticides that use the use of other living things to achieve the same goal of eradicating unwanted species. The presence of a wide variety of different species across the landscape can have numerous positive effects on the local ecology. Plant disease biological control agents are more commonly referred to as antagonists in scientific literature. Antipathogens are helpful bacteria that inoculate the surfaces of plants via a variety of different techniques. As newly emerging seedlings push through the soil, soils that are rich in a diverse range of microorganisms have the potential to inoculate the leaves and tissues of the plants. Growers also have the option of using commercially available products to apply antagonists in the form of a foliar spray or soil drench. Bacillus subtilis is a naturally occurring bacterium that may be found in soil as well as in the digestive tracts of cattle and people. It has demonstrated a great deal of promise in the treatment and prevention of diseases such as powdery mildew. However, it has been demonstrated that certain antagonists, such as the aizawai strain of Bacillus thuringiensis (Bt), can kill beneficial insects such as bees. These organisms do not pose a threat to human health.

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4. **Chemical Methods of Regulation**

The use of chemical controls should only be considered as a last resort when controlling pests. There are several different approaches to applying chemicals that are used for pest control, and each one has a different level of effectiveness. When applying pesticides, it is imperative that you observe the on-label directions for correct handling methods and that you wear the necessary personal protection equipment (PPE). It is imperative that the user apply these substances only to the affected plants, and in some cases, only to the part of the plant that is being affected. While certain concoctions can be used as a preventative that is applied to many plants, the use of chemicals like botanical poisons requires that the user apply these substances only to the affected plants. Because this list is so extensive and is constantly being updated, readers are strongly encouraged to either invest in a high-quality organic gardening encyclopaedia or search the internet for reliable sources that can serve as references for additional organic acids. The latter option is highly recommended.

There are some controls, such as neem oil, that can eradicate pests that are found in more than one kingdom of creatures. Neem oil, when applied in the form of a spray, is effective in warding off fungal diseases such as powdery mildew as well as more than 200 insect pests. Neem oil is an extract made from the neem tree. It is used for a wide range of things, such as getting rid of plant pests, making household items, and treating medical conditions.

Up high or down low

Some common gardening techniques, like staking and pruning, can help tomatoes stay healthy and produce bigger fruit. The type of tomato you are cultivating should determine both the type of support system you use and the level of intensity with which you prune your crop.

What is the key distinction between staking and trimming a plant?
because the majority of the plant's energy is directed towards the fruit, pruned plants provide fruit that is both larger and harvested earlier. When the sprouts are the length of four inches, prune them. Stakes made of wooden, or metal are required for staking plants. Examples of metal stakes include rebar and T-posts.

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Topping/adding additional soil

A technique or practice known as topdressing involves adding a layer of new, additional soil on top of the soil that is already there. The objective is to revitalize the soil and restore the nutrients it once contained. The material or modification itself can alternatively be referred to as "topdressing," which is itself a word (usually soil mix or sand). Putting topdressing mix on a plant is called topdressing. Although it is possible to use dirt for container plants, this does not necessarily indicate that you should. If you do this, your plant will probably not receive the nutrients it requires, it won't develop as quickly as you anticipate, and it will probably perish much sooner than it otherwise would. It's possible that the "topsoil" that's best for vegetable gardens isn't even soiled at all.

The many benefits of using topdressing

• A plant or grass can benefit from additional nutrients added through the process of topdressing. It contributes to a reduction in the requirement for frequent fertilization.

• This procedure contributes to the organic matter content of the soil being more abundant.

• In addition, it helps the soil keep its lightness and airiness, which goes against the way soil naturally gets heavier over time.
• Topdressing promotes soil structure.

• Soil that has been properly constructed possesses higher capabilities for retaining water and provides a more productive environment for plant growth.

• The ground will become more permeable once you have added soil mix or compost to it. By doing this, local gas exchanges are made as good as possible, which helps roots grow in a healthy way.

In addition to this, there are several advantageous collateral effects:

• There is no requirement to apply fertilizer in the first year.
• The need for water has decreased.
• The containers and pots look like they are getting better, and it might be a while before they need pretty mulch.

Module 5: Quiz

1.What does n-p-k stand for?

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2.What two things are phosphorus essential for?

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3.What benefits do worms offer?

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4.What do worm castings release in the soil?

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Write in your journal any new thoughts ideas or feelings you have pertaining to gardening or the course