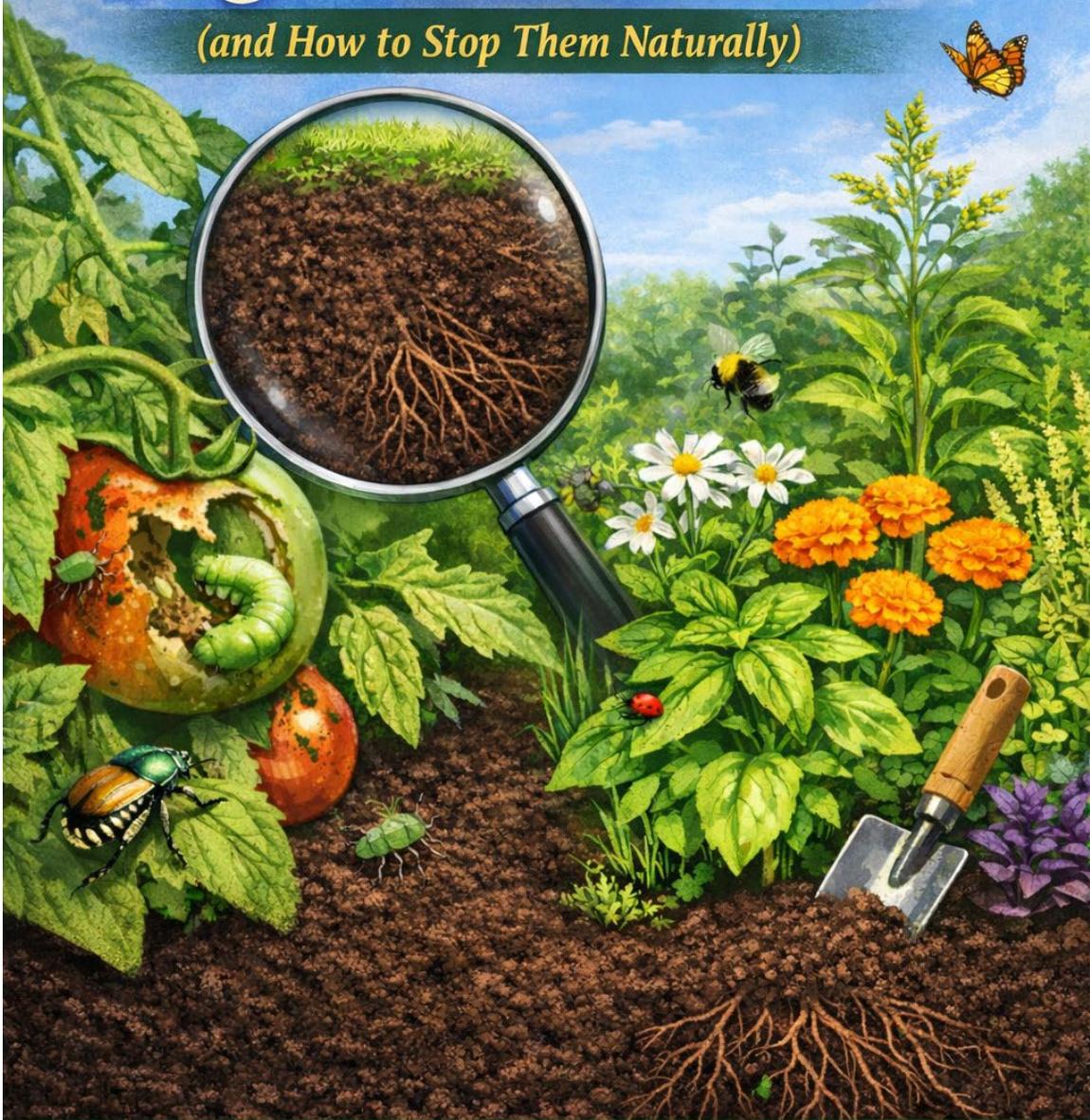


Volume 1: Aphids to Flea Beetles

# — Why Pests — Target Your Garden

*(and How to Stop Them Naturally)*



*Nutrient Deficiencies, Companion Plants,  
and Organic Control Strategies*

by Laurie Neverman of Common Sense Home

***Why Pests Target Your Garden (and How to Stop Them Naturally)***

***Organic Pest Control Guide Volume 1***

***Aphids to Flea Beetles***

*By Laurie Neverman*

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# The Pest Control Tool Box

I've read dozens of gardening books and hundreds of articles, plus I've been gardening in some form or another for over 50 years. From helping my mom in our sprawling country garden, to container plants in college, to our raised cedar bed garden in the suburbs, to a tiny plot in the city while we were building our current home, back out to the country again, I've seen a lot of different pests. I've helped our readers troubleshoot pests in their gardens, too.

I wanted to pull together all the different techniques for organic pest management in easy to follow guides, where you could look up your pest and have a full “set of tools” for control. This guide contains:

- Tips for Identifying Pests and Their Damage
- Companion Plant Recommendations
- Barriers & Physical Controls
- Sprays & Dusts
- Natural Fertilizers and Foliar Feeds to address nutrient deficiencies that attract insects to plants

**Note: Many of the pests have similar feeding habits, and are associated with similar nutrient deficiencies. Feel free to mix and match controls and fertilizers to find the solution that works best in your garden. For instance, the entries for aphids and peach tree aphids offer different options to deal with very closely related pests. Work with what you have available.**

*If you want to keep things simple, start with calcium as a foliar feed. It helps with just about everything.*

## **Why have fertilizers and foliar sprays in a pest control book?**

According to Dr. Arden Andersen in his book, “The Anatomy of Life & Energy in Agriculture” (and other researchers), pests are more attracted to plants when those plants are lacking in specific nutrients. Address these nutrient deficiencies, and you’ll see a dramatic improvement in plant health and vigor – and fewer pests. I combined Dr. Andersen’s list of nutrient deficiencies associated with specific pests with fertilizer and foliar feed recommendations that address those deficiencies.

Applying foliar sprays can quickly correct nutrient imbalances and strengthen plants. The fertilizers and foliar feed recommendations are based on regenerative gardening principles. To strengthen plant defenses and correct mineral imbalances, regenerative practices focus on bioavailable, organic amendments.

To use these guides, identify your insect, and then choose the strategy or combination of strategies you want to use for control. Each insect entry includes a description of the pest and the damage it does to help with identification.

When using foliar feeds, remember the following tips:

- Apply foliar sprays early in the morning or in the late afternoon to maximize nutrient absorption.
- Alternate different foliar feeds every 7-10 days to maintain a balance of nutrients and support overall plant health.
- **Avoid overusing nitrogen-based fertilizers, as excessive nitrogen can lead to weak, pest-attracting growth.**

# Aphids

## Aphids: Identification, Damage, and Nutrient Link



Aphids are small, soft-bodied insects that can be green, yellow, black, brown, or even pink. They cluster on the undersides of leaves and along tender stems, where they feed by sucking sap from the plant. This weakens the plant, causing curled or yellowing leaves, distorted new growth, and reduced vigor. Aphids also excrete a sticky substance called honeydew, which can attract ants and lead to sooty

mold growth on leaves.

The presence of aphids often indicates that the plant is deficient in **calcium, phosphorus, iron, and copper**. These deficiencies lead to weaker cell walls and reduced metabolic efficiency, making plants more susceptible to aphid infestations. We find that our greenhouse plants run into trouble with aphids, because they are protected from the wind and rain (that can knock them off the plants). There are also fewer natural predators in the greenhouse, and the plants get stressed due to the temperature swings.

## Control Strategies

### *Companion Planting*

- **Repellent Plants:** Garlic, onions, chives, leeks, and marigolds emit odors that aphids dislike, discouraging them from settling on nearby plants.

- **Trap Crops:** Nasturtiums and mustard greens are highly attractive to aphids and can be planted as sacrificial crops to lure aphids away from more valuable plants.
- **Predator-Attracting Plants:** Dill, fennel, yarrow, and alyssum provide nectar for ladybugs, lacewings, and parasitic wasps, which prey on aphids.

### *Barriers & Physical Controls*

- **Row Covers:** Floating row covers can physically prevent aphids from reaching plants but should be removed once flowering begins to allow for pollination.
- **Water Sprays:** A strong jet of water from a hose can knock aphids off plants, reducing their numbers. This works best in the morning so the plant has time to dry before evening.
- **Hand Removal:** For small infestations, manually squishing aphids or wiping them off with a damp cloth can be effective.

### *Sprays and Dusts*

- **Neem Oil:** Disrupts aphid reproduction and feeding. Apply in the early morning or late evening to avoid harming pollinators.
- **Garlic or Chili Spray:** A homemade spray made from crushed garlic or hot peppers mixed with water and a bit of soap can deter aphids.
- **Insecticidal Soap:** A diluted soap solution (using an organic, biodegradable soap) can suffocate aphids when sprayed directly onto them.
- **Diatomaceous Earth (DE):** A fine dust applied around the base of plants can deter crawling aphids, but should be used sparingly to avoid harming beneficial insects.

## **DIY Garlic-Chili Spray**

Blend 1 garlic bulb, 2 hot peppers, and 1 quart of water. Let sit for 24 hours, strain, and add a few drops of castile soap. Dilute 1:4 and spray foliage and soil around the plant base.

## **Fertilizer and Foliar Spray Recommendations**

### *Soil Amendments*

- **Calcium:** Apply gypsum, eggshell powder, or finely ground oyster shell to increase calcium levels.
- **Phosphorus:** Use rock phosphate or bone meal to improve phosphorus availability.
- **Iron:** Add chelated iron or seaweed-based fertilizers to boost iron levels.
- **Copper:** Apply copper sulfate in very small amounts, or use compost with copper-rich inputs such as seaweed.

### *Foliar Feeds*

- **Calcium Boost:** Diluted whey, fish hydrolysate, or a fermented plant extract (such as nettle tea) can provide bioavailable calcium.
- **Phosphorus-Rich Spray:** Make a compost extract or fermented fruit peel tea to supply bioavailable phosphorus.
- **Iron-Rich Foliar Feed:** Spray plants with a seaweed extract or a diluted iron sulfate solution.
- **Copper Tonic:** Use a mild kelp tea, which naturally contains trace amounts of copper, or a compost tea made with copper-rich plant material.

# Aphids, Green Peach

## Green Peach Aphids: Identification, Damage, and Nutrient Link



Green peach aphids are small, soft-bodied insects—typically light green, but sometimes pink—with long antennae and pear-shaped bodies. They feed on plant sap by piercing soft plant tissues, especially new growth. Colonies are often found clustered on the undersides of leaves, flower buds, and shoot tips.

### Damage Symptoms:

- Curled, yellowing, or deformed leaves
- Sticky honeydew excreted by aphids, which attracts ants and promotes black sooty mold
- Reduced vigor in young plants
- Distortion of flowers or fruit

Green peach aphids are likely to target plants **deficient in calcium, phosphorus, copper, and iron:**

- **Calcium:** Needed for strong cell walls and resistance to sucking insects
- **Phosphorus:** Supports plant metabolism and root development
- **Copper:** Vital for lignin formation and immune response
- **Iron:** Critical for chlorophyll formation and energy transfer

Plants lacking these minerals are less resilient and produce amino acids in forms that make them more attractive to sap-feeding insects like aphids.

## **Control Strategies**

### *Companion Planting*

- **Repellent Plants:** Garlic, chives, and onions help deter aphids with sulfur compounds. Catnip and basil may confuse aphids and reduce colonization.
- **Trap Crops:** Nasturtiums and mustard greens are highly attractive to aphids—use as early-season decoys. Once heavily infested, remove and destroy to reduce aphid pressure.
- **Attract Beneficial Insects:** Yarrow, dill, fennel, and alyssum draw ladybugs, lacewings, and hoverflies, whose larvae voraciously consume aphids.

### *Barriers & Physical Controls*

- **Reflective Mulch:** Aluminum or silver-colored mulch beneath plants confuses aphids by reflecting UV light, making it harder for them to locate host plants.
- **Row Covers:** Lightweight floating row covers can prevent aphid colonization on young seedlings and transplants—remove once flowering begins to allow pollination.
- **Ant Management:** Ants “farm” aphids for their honeydew and protect them from predators. Control ants with barriers like sticky bands on plant stems or diatomaceous earth rings at the base.

- **Remove Infested Growth:** Prune heavily infested tips or leaves early to prevent colony establishment.

### *Sprays and Dusts*

- **Neem Oil:** Acts as a repellent, feeding inhibitor, and hormone disruptor. Mix 1–2 teaspoons per quart of water with a few drops of mild soap and spray weekly until populations decline.
- **Insecticidal Soap:** Effective at suffocating aphids on contact. Spray thoroughly on undersides of leaves in early morning or evening to avoid burning foliage.
- **Garlic-Pepper Spray:** Blend several cloves of garlic with a hot pepper and a quart of water. Strain, add a small amount of soap, and spray foliage weekly.
- **Diatomaceous Earth:** Apply food-grade diatomaceous earth around the base of infested plants or on leaves if conditions are dry. Avoid when wet, as it becomes ineffective.

## **Fertilizer and Foliar Spray Recommendations**

### *Soil Amendments*

- **Calcium:** Apply gypsum or ag lime based on your soil's pH. Crushed eggshells or shell flour (calcium carbonate) can be composted or fermented in vinegar.
- **Phosphorus:** Add bone meal, fish bone meal, or soft rock phosphate to boost soil P reserves. Compost made with poultry litter is also high in phosphorus.
- **Copper:** Apply compost enriched with seaweed or use small amounts of copper sulfate (with soil test confirmation). Azomite and other volcanic minerals can help with copper and trace element supplementation.

- **Iron:** Use iron sulfate or chelated iron for quick uptake if deficiencies are visible (e.g., yellowing between veins). Compost teas, especially those made with nettles or alfalfa, are helpful in gently increasing iron availability.

### *Foliar Feeds*

- **Fermented Nettle Tea:** Rich in iron, calcium, and silica. Soak nettles in water (10:1 ratio) for 1–2 weeks until bubbly. Dilute 1:10 and apply as a foliar spray weekly.
- **Fermented Eggshell Vinegar:** A good source of calcium. Mix equal parts finely crushed eggshell and vinegar. Let sit until bubbling stops. Dilute 1:50 with water and spray on foliage every 7–10 days.
- **Banana Peel Extract:** Provides phosphorus and potassium. Ferment banana peels with water and molasses for 5–7 days. Dilute 1:20 and spray during active growth to encourage strong development.
- **Liquid Seaweed or Kelp Extract:** For copper and general micronutrients. Apply at 1–2 tablespoons per gallon as a foliar spray. Seaweed supports copper, selenium, and trace minerals, and contains natural growth hormones.

# Cabbage Loopers

## Cabbage Loopers: Identification, Damage, and Nutrient Link



Cabbage loopers (*Trichoplusia ni*) are light green caterpillars with white stripes running down their sides. They move in a characteristic "looping" motion, arching their bodies as they travel across leaves. These larvae primarily attack brassicas such as cabbage, kale, broccoli, and cauliflower, chewing irregular holes in leaves and sometimes burrowing into developing heads. Heavy infestations can stunt

plant growth and make crops unmarketable.

Cabbage loopers thrive on plants that are deficient in **phosphorus, calcium, vitamin C, and iron**. These nutrients play essential roles in plant resilience, structural integrity, and metabolic function.

## Control Strategies

### *Companion Planting*

- **Repellent Plants:** Thyme, dill, oregano, and peppermint produce strong scents that deter cabbage loopers. Onions, garlic, and chives release sulfur compounds that discourage caterpillars.
- **Trap Crops:** Mustard and radish greens can lure loopers away from more valuable cabbage and broccoli plants.

- **Predator-Attracting Plants:** Alyssum, yarrow, and fennel provide nectar for beneficial insects such as parasitic wasps and lacewings, which prey on cabbage loopers.

#### *Barriers & Physical Controls*

- **Row Covers:** Floating row covers prevent adult moths from laying eggs on plants. Use them early in the season and remove them before flowering to allow pollination.
- **Handpicking:** Inspect plants regularly and remove loopers by hand, especially in small gardens. Dropping them into soapy water ensures they don't return.
- **Egg Removal:** Check the undersides of leaves for looper eggs and scrape them off before they hatch.

#### *Sprays and Dusts*

- **Bacillus thuringiensis (Bt):** This organic bacterial spray targets caterpillars, killing them within a few days while sparing beneficial insects. Apply in the evening to avoid degradation from sunlight.
- **Neem Oil:** Disrupts the feeding and molting cycles of young cabbage loopers, reducing their ability to grow and reproduce.
- **Garlic or Chili Spray:** A homemade spray made from blended garlic, hot peppers, and water can deter loopers from feeding on plants.
- **Diatomaceous Earth (DE):** A dusting of DE around the base of plants can deter crawling larvae, though it should be used sparingly to avoid harming beneficial insects.

## Fertilizer and Foliar Spray Recommendations

### *Soil Amendments*

Since cabbage loopers thrive on plants deficient in **phosphorus, calcium, vitamin C, and iron**, improving soil health is critical:

- **Phosphorus:** Apply rock phosphate, bone meal, or composted manure to support root development and plant resilience.
- **Calcium:** Use gypsum, eggshell powder, or finely ground oyster shell to increase calcium levels.
- **Vitamin C:** Compost rich in diverse organic matter helps plants synthesize vitamin C. Adding fermented plant extracts or compost tea can boost plant health.
- **Iron:** Apply chelated iron, seaweed-based fertilizers, or iron-rich compost inputs such as nettles and comfrey.

### *Foliar Feeds*

- **Phosphorus-Rich Spray:** A compost extract or fermented banana peel tea provides bioavailable phosphorus.
- **Calcium Boost:** A diluted whey or fermented nettle tea spray strengthens cell walls, making plants less attractive to loopers.
- **Vitamin C Support:** A seaweed extract or compost tea spray can help plants enhance their own vitamin C production.
- **Iron Supplement:** A foliar spray made from diluted iron sulfate, seaweed extract, or nettle infusion provides an iron boost.

# Cane Borers

## Cane Borers: Identification, Damage, and Nutrient Link

Cane borers are the larvae of various beetles and moths that tunnel into the stems (canes) of bramble fruits like raspberries, blackberries, and roses. These pests cause visible swelling, wilting, and dieback in affected canes. In some cases, you may notice small entry holes near the base of the plant or frass (sawdust-like excrement) around the stems. We have some troubles with them in our raspberry patch, but our roses and blackberries are rarely bothered.

Plants that are **deficient in calcium, phosphorus, vitamin C, and vitamin E** tend to be more susceptible to cane borers. Calcium is crucial for strong cell walls, phosphorus supports root and stem integrity, vitamin C enhances the plant's immune response, and vitamin E helps reduce oxidative stress.

## Control Strategies

### *Companion Planting*

- **Repellent Plants:** Garlic, onions, and chives deter borers with their strong sulfur compounds. Marigolds and tansy can repel adult beetles and moths that lay eggs on plant stems.
- **Trap Crops:** Sunflowers can be planted nearby to lure cane borers away from brambles. Wild mustard and radishes can also attract pests away from valuable plants.
- **Predator-Attracting Plants:** Yarrow, fennel, and alyssum attract parasitic wasps that target cane borer larvae. Clovers and buckwheat help sustain beneficial insect populations.

### *Barriers & Physical Controls*

- **Pruning and Removal:** Regularly inspect canes for swelling or entry holes. Cut out and destroy infested canes to prevent larvae from maturing. Prune canes in late winter before adult borers emerge to lay eggs.
- **Row Covers:** Floating row covers can be placed over young plants to prevent adult insects from laying eggs. Remove covers when flowers bloom to allow for pollination.
- **Sticky Traps:** Use sticky yellow or blue traps near plants to capture adult borers before they lay eggs.
- **Mulching:** Apply a thick layer of mulch to suppress weeds and create a less hospitable environment for borers. Use straw, wood chips, or composted leaves.

### *Sprays and Dusts*

- **Neem Oil:** Spray neem oil on plant stems to deter egg-laying by adult borers.
- **Diatomaceous Earth (DE):** Dust DE around the base of canes to reduce larvae that attempt to pupate in the soil.
- **Garlic or Hot Pepper Spray:** A homemade spray made from crushed garlic or hot peppers mixed with water and a small amount of soap can deter adult borers.
- **Bacillus thuringiensis (Bt):** If cane borers are from a moth species, Bt can be applied to young canes to kill larvae before they burrow into stems.

## **Fertilizer and Foliar Spray Recommendations**

### *Soil Amendments*

- **Calcium:** Apply gypsum, crushed eggshells, or oyster shell powder to increase calcium levels.

- **Phosphorus:** Use rock phosphate or bone meal to support root and cane strength.
- **Vitamin C:** Compost rich in organic matter, particularly with fruit and plant-based inputs, helps plants synthesize vitamin C. Fermented plant extracts can also support this process.
- **Vitamin E:** Use nutrient-dense compost and seaweed-based amendments to supply vitamin E precursors.

### *Foliar Feeds*

- **Calcium Boost:** A fermented plant extract made from nettles or horsetail provides bioavailable calcium. A diluted whey or fish hydrolysate spray can also help strengthen cell walls.
- **Phosphorus-Rich Spray:** Make a compost extract or fermented banana peel tea to supply bioavailable phosphorus.
- **Vitamin C Support:** A seaweed extract or a compost tea spray enhances plant immune response.
- **Vitamin E Supplement:** Spray plants with a diluted alfalfa or kelp extract, which naturally contains precursors to vitamin E.

# Corn Earworm

## Corn Earworm: Identification, Damage, and Nutrient Link



The corn earworm (*Helicoverpa zea*), also known as the tomato fruitworm, is a destructive pest of corn, tomatoes, peppers, and other crops. Adult moths lay eggs on the silks of corn, and when the larvae hatch, they burrow into the developing ears, feeding on kernels and leaving behind frass (insect waste). Damaged kernels may also become vulnerable to mold and secondary pest infestations.

Corn earworm infestations often indicate that plants are deficient in **calcium, phosphorus, and manganese**. Calcium strengthens plant cell walls, reducing pest vulnerability. Phosphorus supports root development and energy transfer, helping plants recover from stress. Manganese plays a role in photosynthesis and plant metabolism, boosting resistance to pest attacks.

Note: Ducks and chickens relish these little squirmers, so make sure to toss them to your flock if you find them in your vegetables. If you trim around the damage, the rest of the cob is safe to use.

## Control Strategies (see also Tomato Fruitworm)

### *Companion Planting*

- **Repellent Plants:** Basil, thyme, and sage emit strong odors that help mask the scent of corn silks, making it harder for moths to find a place to lay eggs. Marigolds and tansy repel a variety of pests, including moths.
- **Trap Crops:** Sunflowers can serve as a trap crop, luring earworms away from corn. The pests prefer to attack sunflower heads, reducing pressure on the main crop.
- **Predator-Attracting Plants:** Dill, fennel, and alyssum attract parasitic wasps that lay eggs inside corn earworm larvae, effectively controlling their population. Buckwheat provides nectar for beneficial insects such as green lacewings and ladybugs, which feed on earworm eggs.

### *Barriers & Physical Controls*

- **Corn Earworm Oil Treatment:** When silks appear, apply a few drops of mineral oil, neem oil, or garlic oil to the tip of each ear. This prevents larvae from moving down into the kernels.
- **Row Covers:** Floating row covers can protect young corn plants from moth egg-laying. Remove them before pollination to allow for natural fertilization.
- **Handpicking:** Regularly inspect corn silks for eggs and tiny larvae. Remove and crush them before they reach the kernels.
- **Crop Rotation:** Rotate corn with non-host crops such as beans, onions, or brassicas to break the pest cycle. Avoid planting corn in the same location for consecutive years.

- **Cultivating the Soil:** In fall or early spring, work the soil to expose any pupae that were overwintering in the soil to weather and insect eaters.

### *Sprays and Dusts*

- **Bacillus thuringiensis var. kurstaki (Bt-k):** A microbial insecticide that specifically targets caterpillar pests without harming beneficial insects. Apply it directly to corn silks as soon as they emerge.
- **Spinosad Spray:** A natural soil-derived insecticide that effectively controls corn earworm larvae. Apply in the evening to avoid harming pollinators.
- **Neem Oil:** Disrupts larval feeding and growth. Apply to silks and leaves, avoiding application during pollination.
- **Diatomaceous Earth (DE):** Lightly dust corn silks to create a physical barrier that dehydrates and deters larvae.
- **Chili-Garlic Spray:** A homemade spray made from blended chili peppers, garlic, and water can repel moths and deter larvae from feeding.

## **Fertilizer and Foliar Spray Recommendations**

### *Soil Amendments*

- **Calcium:** Apply gypsum, crushed eggshells, or lime to improve calcium levels. Bone meal provides a slow-release calcium source.
- **Phosphorus:** Use rock phosphate, bone meal, or composted manure to boost phosphorus availability.
- **Manganese:** Apply kelp meal, seaweed extract, or compost rich in trace minerals to enhance manganese levels.

### *Foliar Feeds*

- **Calcium Boost:** Apply fermented egg shell tea or a diluted whey spray to fortify plant cell walls.
- **Phosphorus-Rich Spray:** Use a fermented banana peel extract or compost tea to supply bioavailable phosphorus.
- **Manganese Supplement:** Spray with seaweed extract or a nettle infusion to provide bioavailable manganese.

# Crown Borers

## Crown Borers: Identification, Damage, and Nutrient Link

Crown borers, particularly the raspberry crown borer (*Pennisetia marginata*), are destructive pests that target raspberries, blackberries, and other cane fruits. The larvae tunnel into the plant's crown and roots, disrupting nutrient flow, weakening the plant, and eventually causing it to wilt or die. Affected plants may show stunted growth, brittle canes, and yellowing leaves.

Crown borer infestations often indicate that the plant is **deficient in calcium, phosphorus, cobalt, and vitamin C**. Calcium strengthens cell walls, preventing pest entry. Phosphorus supports root health and energy transfer. Cobalt plays a role in nitrogen metabolism and plant stress resistance. Vitamin C (ascorbic acid) is essential for plant immunity and pest resistance. To control crown borers organically, gardeners should focus on preventing egg-laying, disrupting larvae development, and improving plant nutrition.

## Control Strategies

### *Companion Planting*

- **Repellent Plants:** Tansy and marigolds emit strong odors that deter moths from laying eggs. Garlic and onions discourage larval feeding.
- **Predator-Attracting Plants:** Dill, fennel, and yarrow attract parasitic wasps that attack crown borer larvae. Buckwheat provides nectar for beneficial insects, including predatory ground beetles.
- **Trap Crops:** Sunflowers can lure borers away from raspberries and blackberries, as the moths prefer to lay eggs on sturdy-stemmed plants.

### *Barriers & Physical Controls*

- **Remove Infested Canes:** In late fall or early spring, inspect plants for swollen cane bases or tunneling. Cut and destroy any infested canes before larvae burrow deeper into the crown.
- **Soil Mounding:** Mound soil or compost around the base of raspberry and blackberry plants in early spring. This helps bury larvae and prevent their emergence.
- **Row Covers:** Floating row covers can prevent adult moths from laying eggs on susceptible plants.
- **Cultivation & Mulching:** Work up the soil around plants in late fall to expose pupae to predators for a few days, taking care not to disturb the plant roots. Follow up with a thick mulch of wood chips, straw, or compost to disrupt larval movement.

### *Sprays and Dusts*

- **Neem Oil:** Apply neem oil sprays to cane bases and surrounding soil to prevent egg hatch and deter larvae.
- **Diatomaceous Earth (DE):** Dust around the base of plants to create a barrier that dehydrates and kills emerging larvae.
- **Bt (*Bacillus thuringiensis*):** A targeted organic insecticide that kills young larvae. Apply as a soil drench around plant bases.
- **Beneficial Nematodes:** Release *Steinernema* spp. nematodes into the soil to hunt and kill crown borer larvae. Apply in spring and fall when larvae are active.

## Fertilizer and Foliar Spray Recommendations

### *Soil Amendments*

- **Calcium:** Apply crushed eggshells, gypsum, or agricultural lime to improve calcium availability.
- **Phosphorus:** Use bone meal, rock phosphate, or composted manure to boost phosphorus.
- **Cobalt:** Incorporate seaweed meal, kelp, or compost rich in trace minerals to supply cobalt.
- **Vitamin C (Ascorbic Acid):** Strengthen plant immunity by spraying with fermented plant extracts rich in vitamin C, such as citrus peel tea.

### *Foliar Feeds*

- **Calcium Foliar Spray:** Use fermented eggshell tea or diluted whey spray for rapid calcium absorption.
- **Phosphorus-Rich Spray:** Apply a banana peel extract or fish hydrolysate spray to supply phosphorus.
- **Cobalt Supplement:** Spray with kelp extract or a diluted seaweed tea for trace minerals.
- **Vitamin C Boost:** Use a fermented citrus peel extract or comfrey tea to enhance plant immunity.

# Cucumber Beetles, Spotted

## Spotted Cucumber Beetle: Identification, Damage, and Nutrient Link



Spotted cucumber beetles (*Diabrotica undecimpunctata*) are small, yellow-green beetles with 12 distinct black spots on their wing covers. Adults feed on the foliage, flowers, and fruit of cucurbit crops like cucumbers, squash, and melons. Larvae, known as corn rootworms, attack the roots, stunting or killing seedlings.

### Damage symptoms include:

- Ragged holes in leaves
- Chewed flowers or young fruits
- Wilting or yellowing plants due to root feeding
- Increased susceptibility to bacterial wilt (they are vectors for the disease)

Spotted cucumber beetles are more likely to target plants that are **low in calcium** (weakened cell walls), **phosphorous** (poor root strength and sugar movement), **iron** (chlorosis and reduced plant vigor), and **copper** (compromised reproductive and immune function).

## Control Strategies

### *Companion Planting*

- **Radishes:** Used as a “trap crop”; beetles prefer them, and they can be removed easily, taking the beetles with them.
- **Tansy, catnip, and nasturtiums:** Repel cucumber beetles with strong aromatic compounds.
- **Marigolds:** Attract beneficial insects and disrupt pest cycles.
- **Blue Hubbard squash:** A known trap crop for both striped and spotted cucumber beetles.

### *Barriers & Physical Controls*

- **Floating row covers:** Cover young plants immediately after transplanting to exclude beetles. Remove covers when flowering begins to allow pollination.
- **Mulching with straw or wood chips:** Disrupts beetle egg-laying and larval development near soil.
- **Sticky traps:** Yellow sticky cards attract and trap adult beetles. Place near plant bases or between rows. Be careful with these – they can also trap pollinators.

### *Sprays*

- **Neem oil (1–2%):** Acts as an antifeedant and reproductive inhibitor. Spray in early morning or evening to avoid harming pollinators.

- **Pyrethrin spray (OMRI-approved):** Effective for severe infestations but use sparingly and target beetles directly.
- **Garlic and chili spray:** Natural deterrent that repels beetles from feeding.

#### *Dusts*

- **Diatomaceous earth (DE):** Apply around plant stems and leaves in the morning. Kills beetles through abrasion. Reapply after rain.
- **Kaolin clay:** Forms a physical barrier on plant surfaces, making them unpalatable and hard to grip. Must be reapplied periodically.

## **Fertilizer and Foliar Spray Recommendations**

#### *Soil Amendments*

- **Crushed eggshells or agricultural lime:** Supply calcium for stronger cell walls and overall vigor.
- **Soft rock phosphate:** Long-term source of phosphorus and trace minerals.
- **Iron sulfate or chelated iron:** Addresses iron chlorosis and supports chlorophyll production.
- **Composted animal manure (e.g., chicken or cow):** Supplies copper and organic matter to boost soil biology and mineral uptake.

### *Foliar Feeds*

- **Eggshell Vinegar Calcium Tonic:** Soak finely ground eggshells in apple cider vinegar for 7–10 days. Strain and apply at 1–2 tbsp per gallon of water. Spray bi-weekly to strengthen leaf tissues.
- **2. Fermented Comfrey Tea:** Rich in phosphorus, iron, and calcium. Fill a bucket with comfrey leaves, cover with water, and ferment for 5–10 days. Strain and dilute 1:10. Apply weekly during beetle pressure.
- **3. Seaweed-Molasses Spray:** Mix 1 tbsp liquid kelp + 1 tbsp blackstrap molasses in 1 gallon water. Spray weekly to provide copper, support enzymatic function, and boost microbial life.
- **4. Iron-Vitamin Compost Tea:** Aerate finished compost with a handful of iron-rich greens (like nettle or lamb's quarters) and add a crushed vitamin C tablet. Apply as a foliar or root drench to improve micronutrient uptake.

# Cucumber Beetles, Striped

## Striped Cucumber Beetle: Identification, Damage, and Nutrient Link



Striped cucumber beetles (*Acalymma vittatum*) are yellow beetles with three distinct black stripes running down their wing covers. Commonly found in cucurbit crops like cucumbers, squash, pumpkins, and melons, these beetles feed on both seedlings and mature plants.

We had terrible problems with these in our first garden in the suburbs after introducing them in contaminated mulch from the yard waste center. They spread bacteria wilt and devastated the vine crops in the garden. In our current garden, I see a few now and then, but since we've improved the soil they don't do serious damage and we've had no bacterial wilt issues. When we first started gardening and the soil was poor, they caused more trouble.

### Damage symptoms include:

- Skeletonized or ragged leaves
- Stunted or wilted seedlings
- Scarring and scabbing on fruits
- Reduced pollination (due to flower damage)

- Transmission of bacterial wilt (*Erwinia tracheiphila*), a deadly disease for cucurbits

Plants suffering from deficiencies in **calcium** (weak cell walls), **phosphorous** (poor energy transfer), **vitamin C** (oxidative stress tolerance), and **copper** (immune function and lignin formation) are more vulnerable to beetle attack and disease transmission.

## Strategies for Managing Striped Cucumber Beetles

### *Companion Planting*

- **Radish (trap crop):** Beetles prefer radish leaves and can be sacrificed or removed.
- **Tansy and catnip:** Emit odors that repel cucumber beetles.
- **Nasturtium and marigold:** Attract predatory insects while confusing pests.
- **Blue Hubbard squash:** Plant as a border crop; it lures beetles away from main crops.

### *Barriers and Physical Controls*

- **Floating row covers:** Place immediately after transplanting to exclude beetles; remove during flowering for pollination.
- **Cloches or mesh plant tunnels:** Protect young plants while they are most vulnerable.
- **Yellow sticky traps:** Place near base of plants to attract and trap beetles. Remember, these may also trap pollinators, so use them sparingly.
- **Mulch with straw or dry leaves:** Helps interrupt beetle egg-laying and protects soil biology.

### *Sprays*

- **Neem oil (1–2%):** Acts as an antifeedant and reproductive inhibitor. Spray in early morning or evening to avoid harming pollinators.

- **Pyrethrin spray (OMRI-approved):** Effective for severe infestations but use sparingly and target beetles directly.
- **Garlic and chili spray:** Natural deterrent that repels beetles from feeding.

#### *Dusts*

- **Diatomaceous earth (DE):** Apply around plant stems and leaves in the morning. Kills beetles through abrasion. Reapply after rain.
- **Kaolin clay:** Forms a physical barrier on plant surfaces, making them unpalatable and hard to grip. Must be reapplied periodically.

## **Fertilizer and Foliar Spray Recommendations**

#### *Soil Amendments*

- **Crushed eggshells or gypsum:** Improve calcium availability and soil structure.
- **Soft rock phosphate:** Slow-release source of phosphorous and micronutrients.
- **Composted greens (e.g., nettles, purslane):** Supply vitamin C, iron, and trace elements naturally.
- **Compost or aged manure:** Enhances soil microbial activity and nutrient cycling.
- **Copper sulfate or copper-rich composted material (e.g., seaweed, cocoa hulls):** Adds bioavailable copper.

#### *Foliar Feeds*

- **Eggshell–Vinegar Calcium Spray:** Ferment crushed eggshells in apple cider vinegar for 7–10 days. Strain and apply 1–2 tbsp per gallon of water as a foliar spray every 1–2 weeks.

- **Fermented Comfrey Tea:** Steep fresh comfrey leaves in water for 7 days, strain, and dilute 1:10. Rich in phosphorous and potassium.
- **Seaweed + Blackstrap Molasses Tonic:** Mix 1 tbsp liquid kelp and 1 tbsp blackstrap molasses in 1 gallon of water. Spray biweekly for a boost of copper and trace minerals.
- **Citrus Peel Ferment (Vitamin C Spray):** Place chopped organic citrus peels in water with a tablespoon of sugar. Ferment 3–5 days, then strain and dilute 1:5. Spray during vegetative growth to boost antioxidant resilience.

# Cutworms, Black

## Black Cutworms: Identification, Damage, and Nutrient Link



Black cutworms (*Agrotis ipsilon*) are a major pest of seedlings and young transplants, particularly in vegetables like tomatoes, peppers, corn, and brassicas. These nocturnal caterpillars hide in the soil during the day and come out at night to chew through stems at the soil line, often severing young plants entirely. Damage appears as wilting, flopped over seedlings, or missing plants after a single night.

Photo is a pupa, the non-feeding, transitional stage where a cutworm caterpillar becomes a nocturnal moth.

In my experience, cutworm issues tend to be worse in areas that have been recently converted from grass to garden. We had a lot of problems with them early on. Keep an eye out for the grubs and pupae when working the soil to plant seeds or transplants and remove them. If you discover damage (or a dead plant), dig in the soil near the base of the plant as soon as possible. You may be able to find the culprit and prevent them from damaging or killing more plants.

A black cutworm infestation suggests that the affected plants may be deficient in calcium, phosphorus, and iron. Calcium strengthens cell walls, making stems tougher and more resistant to damage. Phosphorus supports root development and plant energy transfer. Iron is essential for chlorophyll production and overall plant health.

## Control Strategies

### *Companion Planting*

- **Repellent Plants:** Garlic, onions, and chives emit strong odors that deter cutworms. Tansy and wormwood disrupt cutworm larvae feeding.
- **Predator-Attracting Plants:** Dill, cilantro, and fennel attract parasitic wasps that lay eggs on cutworms. Buckwheat attracts ground beetles, which prey on cutworm larvae.
- **Trap Crops:** Mustard and radishes lure cutworms away from main crops. Check these plants regularly and remove larvae.

### *Barriers & Physical Controls*

- **Collars Around Seedlings:** Create a physical barrier by placing cardboard, aluminum foil, or toilet paper rolls around young plants. This prevents cutworms from reaching and cutting the stem.
- **Diatomaceous Earth (DE):** Sprinkle around plant bases to create a rough surface that dehydrates and kills cutworms.
- **Cultivation & Hand Removal:** Work up the soil in late fall or early spring to expose overwintering larvae and pupae to predators. If you have chickens or ducks, they'll do the work for you if you allow them access to the garden beds. Our ducks are free range, so they have access to the full garden in the off season. We use temporarily pens and a chicken tractor to give the chickens access to specific beds. (They dig too much to have year round access to the garden.) Hand-pick larvae in the evening or early morning and drop them into soapy water.

- **Encourage Birds & Predators:** Install birdhouses and perches to attract insect-eating birds like robins and wrens. Encourage toads and frogs in the garden by keeping a water source nearby. Small snakes like northern red bellies and garter snakes will also enjoy these as a meal.

### *Sprays and Biological Controls*

- **Neem Oil:** Apply neem oil around the base of plants to disrupt larval development.
- **Bt (*Bacillus thuringiensis* var. *kurstaki*):** A natural bacterial insecticide that specifically targets caterpillars. **Spray in the evening** when cutworms emerge to feed.
- **Beneficial Nematodes:** Apply *Steinernema carpocapsae* nematodes to infested soil to hunt and kill cutworm larvae. Best applied in spring and fall, following package directions for soil application.
- **Molasses Trap:** Mix 1 part molasses with 4 parts water and place shallow bowls near plants. Cutworms are drawn to the mix and drown.

## **Fertilizer and Foliar Spray Recommendations**

### *Fertilizers to Correct Deficiencies*

- **Calcium:** Add gypsum, crushed eggshells, or agricultural lime to soil.
- **Phosphorus:** Use bone meal, rock phosphate, or composted manure.
- **Iron:** Apply iron-rich compost, seaweed extract, or chelated iron.

### *Foliar Feeds*

- **Calcium Foliar Spray:** Use fermented eggshell tea or diluted whey to provide bioavailable calcium.

- **Phosphorus-Rich Spray:** Apply a banana peel extract or fish hydrolysate spray to supply phosphorus.
- **Iron Supplement:** Spray with kelp extract or a nettle tea infusion for iron and trace minerals.

# Cutworms, Variegated

## Variegated Cutworms: Identification, Damage, and Nutrient Link



Variegated cutworms (*Peridroma saucia*) are nocturnal caterpillars that attack a wide range of crops, including lettuce, tomatoes, peppers, carrots, beans, and brassicas. They are recognized by their brownish-gray bodies with yellowish stripes and dark spots along their backs. Unlike black cutworms, which typically sever seedlings, variegated cutworms feed on leaves, stems, and

even fruit, often leaving large, irregular holes. In high numbers, they can defoliate plants completely, weakening them significantly.

Plants infested with variegated cutworms are likely **deficient in calcium, phosphorus, and iron.**

Calcium is essential for strong cell walls and structural integrity, making plants more resistant to pests. Phosphorus supports energy transfer and root development, helping plants recover from insect damage. Iron plays a key role in chlorophyll production and overall plant vigor.

## Control Strategies

### *Companion Planting*

- **Repellent Plants:** Garlic, onions, and chives deter cutworms with their strong scent. Tansy, wormwood, and mint emit odors that disrupt cutworm feeding behavior.

- **Predator-Attracting Plants:** Dill, cilantro, and fennel support parasitic wasps that prey on cutworms. Sunflowers and marigolds draw in beneficial insects, such as ground beetles and lacewings.
- **Trap Crops:** Radishes, mustards, and clover lure cutworms away from main crops. Inspect these plants regularly and remove larvae.

### *Barriers & Physical Controls*

- **Seedling Collars:** Use cardboard, plastic cups, or aluminum foil around young seedlings to prevent cutworms from reaching stems.
- **Diatomaceous Earth (DE):** Sprinkle DE around plant bases to create a barrier that dehydrates and kills cutworms upon contact.
- **Cultivation & Hand Removal:** Turn soil in fall or early spring to expose overwintering cutworm pupae to predators. Hand-pick caterpillars at dusk when they emerge to feed. Drop them into soapy water.
- **Encourage Natural Predators:** Install birdhouses and perches to attract insect-eating birds. Provide water and shelter to encourage toads and frogs, which eat cutworms.

### *Sprays and Biological Controls*

- **Neem Oil:** Apply neem oil around plant bases and on leaves to disrupt cutworm feeding and molting.
- **Bt (*Bacillus thuringiensis* var. *kurstaki*):** A natural bacterium that targets caterpillars while sparing beneficial insects. Spray in the evening when cutworms begin feeding.
- **Beneficial Nematodes:** Introduce *Steinernema carpocapsae* nematodes into the soil to infect and kill cutworm larvae. Apply in spring and fall when larvae are present.

- **Molasses Trap:** Mix 1 part molasses with 4 parts water and place shallow dishes near affected plants. Cutworms are attracted to the mixture and drown.

## **Fertilizer and Foliar Spray Recommendations**

### *Soil Amendments*

- **Calcium Sources:** Gypsum, crushed eggshells, and agricultural lime help fortify plant tissues.
- **Phosphorus Sources:** Apply bone meal, rock phosphate, or aged manure to improve phosphorus availability.
- **Iron Sources:** Use iron-rich compost, seaweed extract, or chelated iron sprays to boost iron levels.

### *Foliar Feeds*

- **Calcium Spray:** Use fermented eggshell tea or diluted whey as a foliar application.
- **Phosphorus Spray:** Apply a banana peel extract or fish hydrolysate to supply bioavailable phosphorus.
- **Iron Spray:** Spray kelp extract or nettle tea to improve iron absorption.

# Corn Borer, European

## Corn Borer: Identification, Damage, and Nutrient Link



The European corn borer (ECB) is a destructive moth whose larvae are major pests of corn, but also attack peppers, beans, potatoes, and apples. The adult moth is light brown with wavy darker lines across its wings, while the larvae are pale pink to light brown with small dark spots along their bodies. Damage becomes evident when young larvae bore into the stalks, ears, or fruit,

disrupting nutrient flow, weakening plant structure, and often causing breakage or poor crop development.

Infestations of ECB may indicate that the plant is deficient in calcium and phosphorus.

## Control Strategies

### *Companion Planting*

- **Repellent Plants:** Basil and dill help repel ECB moths through their strong aromatic compounds. Geraniums and tansy may confuse moths and mask the scent of vulnerable crops.
- **Predator-Attracting Plants:** Yarrow, sweet alyssum, and cosmos attract lacewings and parasitic wasps (such as *Trichogramma* spp.), which lay eggs inside ECB eggs. Buckwheat and fennel support predatory beetles and tachinid flies that prey on larvae.

- **Trap Crops:** Early planted corn or sunflowers can serve as trap crops. Monitor and destroy infected plants before larvae mature.

#### *Barriers & Physical Controls*

- **Row Covers:** Use floating row covers during the moth's egg-laying season (late spring to early summer). Remove covers during pollination for corn.
- **Remove Egg Masses:** Inspect leaves for flat, white egg masses and remove them manually. Moths often lay eggs on the underside of leaves near the midrib.
- **Crop Rotation and Sanitation:** Rotate corn and other host crops yearly to disrupt the ECB lifecycle. At the end of the season, chop and compost or destroy stalks to prevent overwintering larvae from maturing.

#### *Sprays and Biological Controls*

- **Bt (*Bacillus thuringiensis kurstaki*):** A highly effective and targeted microbial insecticide. Apply to the whorls and silks of corn when ECB activity is detected. Use in the evening or early morning for maximum ingestion by feeding larvae.
- **Neem Oil:** Though less effective on borers already inside the plant, neem can act as a deterrent to moths and disrupt larvae development when sprayed on leaves and silks during early infestation stages.
- **Dusts:** Kaolin clay creates a physical barrier on plant surfaces, discouraging egg-laying and feeding. Apply during early ear formation and reapply after rain.
- **Pheromone Traps:** Use to monitor adult moth population levels and time interventions like Bt spraying more precisely.

## Fertilizer and Foliar Spray Recommendations

### *Soil Amendments*

#### **Calcium:**

- **Gypsum** (calcium sulfate) improves calcium without raising soil pH.
- **Crushed eggshells** (aged or fermented) or **agricultural lime** (for acidic soils) also work well.
- **High-quality compost** from calcium-rich sources (like seaweed or nettles) supports uptake.

#### **Phosphorus:**

- **Bone meal** is an excellent slow-release organic phosphorus source.
- **Rock phosphate** works in acidic soils; **composted poultry manure** offers a balanced P boost.
- Maintain a **strong soil biology** (with compost and mycorrhizal fungi) to make phosphorus bioavailable.

### *Foliar Feeds*

#### **Calcium Foliar Sprays:**

- **Fermented eggshell tea:** Soak crushed eggshells in a small amount of vinegar until bubbling stops. Dilute 1:50 with water and apply weekly.
- **Whey or milk spray:** Use raw whey diluted 1:10. Adds calcium and beneficial microbes.

### **Phosphorus Foliar Sprays:**

- **Banana Peel Extract:** Ferment banana peels with molasses and water for 7–10 days. Dilute 1:20 and apply during early growth and pre-flowering.
- **Fish hydrolysate:** Dilute to 1–2 tablespoons per gallon of water. Apply to leaves and soil.

# Flea Beetles

## Flea Beetles: Identification, Damage, and Nutrient Link



Flea beetles are tiny, shiny, jumping beetles ranging from black to bronze, blue, or striped, depending on the species. Measuring about 1/16 to 1/8 inch long, they move quickly and leap like fleas when disturbed. These pests chew small, round holes in leaves, producing a characteristic "shot-hole" pattern. On seedlings, heavy feeding can be fatal, stunting or killing the plant.

Brassicas, eggplant, radish, arugula, tomatoes, potatoes, and spinach are common targets. We had problems with these early on in our garden. They went after the bean, pepper, and radish seedlings

Flea beetles are often drawn to plants **deficient in calcium, phosphorus, and selenium:**

- **Calcium** is vital for strong cell walls and pest resistance.
- **Phosphorus** supports energy transfer and early plant vigor, helping seedlings recover from feeding.
- **Selenium**, though a micronutrient, supports antioxidant function and enhances stress resistance in plants and humans.

## Control Strategies

### *Companion Planting*

- **Repellent plants:** Mint, catnip, and basil emit aromatic compounds that deter flea beetles. Garlic and chives can also reduce beetle populations through scent masking.
- **Trap crops:** Plant radish or arugula as sacrificial crops. Flea beetles prefer them over many vegetables. Once heavily infested, remove and dispose of the trap crops. Chinese Napa cabbage is also effective in drawing beetles away from other brassicas.
- **Attractor plants for beneficial insects:** Sweet alyssum and dill draw in predatory insects like hoverflies and parasitic wasps.

### *Barriers & Physical Controls*

- **Floating Row Covers:** Use insect mesh or floating row covers over susceptible crops immediately after planting. Secure edges to prevent beetle entry. Remove only during flowering if pollination is needed.
- **Mulching:** Apply a thick straw or leaf mulch around seedlings. It discourages beetles from jumping between plants and provides habitat for predatory insects.
- **Timing and Succession:** Delay planting of susceptible crops until the peak flea beetle hatch (often early spring) has passed. Alternatively, start seedlings indoors and transplant when they are hardier.
- **Coffee Grounds:** Sprinkle used coffee grounds on and around the affected plants. The strong scent and residual oils repel the pests.

### *Sprays and Dusts*

- **Neem oil:** Acts as both a repellent and growth inhibitor. Spray on seedlings weekly at a 0.5–1% solution concentration (roughly 1 tablespoon per gallon of water). Reapply after rain.
- **Kaolin clay:** Forms a white, powdery barrier on leaves, making it difficult for beetles to chew or lay eggs. Apply early and reapply after rainfall or heavy dew.
- **Pyrethrin Sprays:** Use only as a last resort and with caution, as pyrethrins are broad-spectrum and can harm beneficial insects. Spot treat in the evening to reduce impact on pollinators.
- **Garlic-Chili Spray:** Blend garlic, hot pepper, and a bit of soap in water. Let steep and strain. Spray in early morning. Effective in repelling beetles without toxic residues.

## **Fertilizer and Foliar Spray Recommendations**

### *Soil Amendments*

- **Calcium:** Apply gypsum (for neutral pH soils) or agricultural lime (for acidic soils). Another good option is crushed eggshells, which can be fermented in vinegar or composted to boost bioavailability.
- **Phosphorus:** Use bone meal or soft rock phosphate to build long-term phosphorus reserves. Incorporate composted poultry manure, which contains readily available phosphorus.

- **Selenium:** Best added through seaweed products, like kelp meal or liquid seaweed extract. Also found in fish hydrolysate, which provides micronutrients in a plant-available form.

### *Foliar Feeds*

- **Fermented eggshell extract:** A great source of calcium. Soak 1 cup of finely crushed eggshells in ½ cup of vinegar until bubbling stops. Dilute 1:50 with water and spray weekly on leaves.
- **Banana peel ferment:** Rich in phosphorus. Ferment banana peels and molasses in water for 5–7 days. Dilute 1:20 and spray during early growth and pre-flowering stages.
- **Liquid kelp extract:** Provides trace selenium, plus other micronutrients and growth hormones. Dilute 1–2 tablespoons per gallon. Apply every 10–14 days.

# Bringing It All Together

Modern gardening often teaches us to fight nature. Regenerative gardening teaches us to look closer, learn, and adapt.

Insects have co-evolved with plants for millions of years. When a particular pest shows up repeatedly, it's rarely random. It's information. Something in the soil-plant system is out of balance, and the insect is responding to that weakness. By shifting from "What do I spray?" to "What is the plant missing?", you move from reaction to regeneration.

This book isn't about memorizing pest remedies. It's about developing a new way of seeing:

- Seeing insects as indicators
- Seeing soil as a living system
- Seeing plant nutrition as the foundation of resistance

When you feed the soil, support microbial life, and provide balanced minerals in plant-available forms, pests lose their advantage. Strong plants simply aren't attractive targets.

The goal isn't a sterile, completely pest-free garden—it's a resilient one, filled with life and abundance. Pests may show up to check things out, but they don't cause significant damage, and they don't get out of control. That's what Resilient Gardening is all about – working with nature instead of trying to dominate it.

I hope you've found these guides helpful, and look forward to many more years of gardening.

Laurie Neverman, Common Sense Home