

Encourage "Wildlife"



Maryland has a great diversity of wildlife. Providing adequate food, water and shelter can increase the number and variety of species that visit your yard.

Actions:

- Plant flowers, vines, shrubs and trees that provide cover, nesting areas or food sources for birds, butterflies and other desirable wildlife. *Credit: 3 inches*
- * Provide, and properly maintain, a water source, such as a birdbath or small pond, for wildlife. (Note: Change birdbath water every other day if mosquitoes are a problem.) *Credit: 1 inch*
- Provide, and properly maintain, wildlife shelters such as a bat house*, birdhouse or a dead tree (snag). *Credit: 1 inch*
- *Some feel that bat houses tend to attract mud daubers better than they do bats.
- Many plants that attract & feed beneficial insects are edible. Plant at least one or two in the garden to do double duty: anise, basil, carrot, coriander, dill, fennel, mints, anise hyssop, kale, Asian greens, parsley, sage and thyme. *Credit: 1 inch*

Control Runoff



Any rain and irrigation water that runs off, carries soil, debris, fertilizer and pesticides from your yard into neighborhood storm drains that lead to local streams, rivers, drinking water reservoirs and the Bay. These substances can harm living organisms, habitats and water quality. Reducing runoff from your garden minimizes these problems.

Actions:

- * Surround raised beds with rigid edges. This will keep garden soil from running off during heavy rains. *Credit: 2 inches*
- Use brick, paving stone or wood chips for walkways between garden beds. Not only does it prevent soil compaction where the roots are growing in the beds, it keeps the soil in place when you have to walk through the garden during rainy weather. *Credit: 2 inches*

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Have a pest or gardening question?
Call the Home and Garden Information Center (HGIC) 1-800-342-2507
or visit us at www.hgic.umd.edu



The Maryland Cooperative Extension's programs are open to all citizens without regard to race, color, gender, disability, religion, age, or national origin.

Are you a Bay-Wise homeowner?

Gardeners can contribute to a cleaner local waterway, Chesapeake Bay and environment by using several environmentally sound approaches.

- [Feed the Soil / Fertilize Wisely](#)
- [Water Efficiently](#)
- [Plant Wisely](#)
- [Recycle Yard Waste](#)
- [Manage Garden Pests with Integrated Pest Management \(IPM\)](#)
- [Protect the Soil with Mulch or Cover Crops](#)
- [Encourage Wildlife](#)
- [Control Water Runoff](#)

Directions: Listed in this brochure are management practices and approaches designed for **fruit and vegetable gardens**. Read through the choices carefully. Select those actions that you have already taken in your garden. Mark off your credits on the yardstick (on the front page) as you complete each action. Your goal is to equal or exceed 36 inches.

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You can order these fact sheets by phone or on-line:

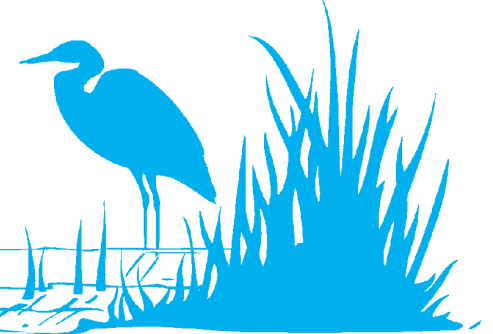
FS	553	Mulches for the Home Garden
Leaflet	245	Home Composting
HG	16	Vegetable Planting Date Chart
HG	40	Composting With Redworms
HG	55	IPM Series: Potatoes
HG	56	IPM Series: Tomatoes
HG	57	IPM Series: Peppers
HG	59	IPM Series: Eggplant
HG	62	IPM: A Common Sense Approach . . .
HG	70	Recommended Vegetable Cultivars for Maryland Home Gardens
HG	566	Some Easily Grown Herbs
EB	252	Control of Insects and Diseases in Vegetable Gardens
HG	72	Root-Knot Nematodes and Vegetable Crops
HG	68	Getting Started With Small Fruits
HG	69	Getting Started With Tree Fruits
HG	76	IPM Series: Pome Fruit
HG	77	IPM Series: Stone Fruit
EB	125	Home Fruit Production Guide
HG	306	How to Measure Your Yard
FS	703	Pet Waste and Water Quality



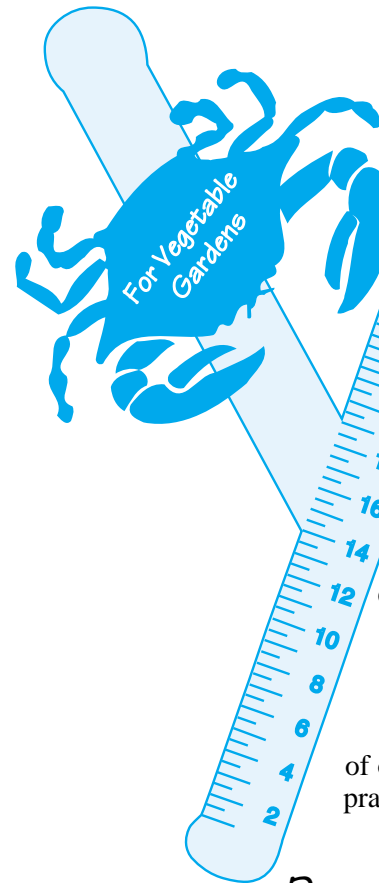
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Bay Wise



Maryland yardstick



The Chesapeake Bay, its rivers and tributary streams play an important role in the lives of Marylanders. They provide us with food, recreation and commerce. Our waterways are declining due, in part, to air pollution and to fertilizer and other pollutants running off Maryland homes and landscapes, farms, sewage treatment plants and industry.

Many Maryland residents live within a half-mile of a storm drain, stream or river. Most of those waterways eventually drain into the Chesapeake Bay. What we do in our own yards can affect the health of our local waterways, the Bay and the environment.

We all need to do our part to take care of our waterways. By changing a few simple practices, you and your family can help keep our Maryland water healthy.

Does your garden measure up?

Feed the Soil / Fertilize Wisely



Many vegetable crops are annuals (have a relatively short lifespan in the garden), have shallow root systems, and compete poorly against weeds for water, light, and nutrients. The soil they grow in must allow for maximum root growth and provide a steady and sufficient supply of nutrients. "Feeding the soil" means adding organic matter on a regular basis.

The organic matter is food for a wide range of soil microorganisms and invertebrates, like earthworms. This dynamic and unseen web of life in the soil is responsible for the slow but steady release of nutrients that are taken up by plant roots. Organic matter also improves soil structure resulting in improved water and air movement and root growth.

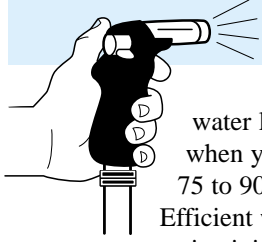
To get the most out of their vegetable patch, many gardeners apply water-soluble fertilizers, which are quick acting. However, fertilizers can be harmful to the environment and your garden if not used properly. When applied at the wrong time or over-applied, fertilizers can burn plants or make them grow excessively (making them more susceptible to insects and diseases). Excess nitrogen and phosphorus (two components of fertilizers) can leach out of the soil and pollute groundwater or wash off gardens and pollute surface waters and eventually, the Chesapeake Bay.

Actions:

- * Test your soil every 3 years. Fertilize and lime according to the soil test recommendations. Call the Home and Garden Information Center (HGIC) at 1-800-342-2507 or your county extension office, to obtain a soil test kit. *Credit: 2 inches*
- * For new or neglected gardens that have not been soil tested, apply 3 pounds of 5-10-5 fertilizer and 5 pounds of ground limestone per 100 square feet or add compost or organic fertilizers. Plan on calling the Home and Garden Information Center (HGIC) at 1-800-342-2507 or your county extension office, to obtain a soil test kit for next year. *Credit: 1 inch*
- If compost is not available, use slow release organic fertilizers on long season crops like tomatoes, and perennial crops like small fruit and asparagus. These include alfalfa meal (nitrogen), rock phosphate (phosphorous), greensand (potassium), cottonseed meal (nitrogen) and kelp or seaweed (trace minerals). *Credit: 1 inch*
- Always read and follow fertilizer label directions. *Credit: 1 inch*
- A water soluble fertilizer is helpful to boost plant growth in the spring and fall. Do not use any more than the recommended rate for any water-soluble fertilizer. Some examples are compost tea, seaweed extract, fish emulsion, and easy-to-mix powdered fertilizers. Apply liquid fertilizers around the base of each plant or as a foliar spray to leaf undersides in morning or evening. *Credit: 2 inches*
- Over applications of nitrogen can promote excessive foliar growth at the expense of fruit production in vegetables like tomatoes, squash, eggplant and peppers. Avoid high nitrogen fertilizers like, urea or ammonium nitrate. *Credit: 1 inch*

* This is a very important practice.

- Lightly side-dress greens and other heavy feeders like broccoli, potatoes and peppers with a complete fertilizer once or twice during the season to push the growth, if needed. *Credit: 2 inches*
- * Incorporate 6 to 8 inches of organic matter (compost or well-aged manure) into new beds, preferably in the fall. This will improve soil tilth (the soil will become lighter and looser and warm up more quickly). Soil organic matter also helps the soil hold and release water and nutrients for improved plant growth. *Credit: 4 inches*
- * Build your soil by incorporating 1 inch of compost to your garden yearly. Regular additions of organic matter often make fertilizer applications unnecessary. Do not add fresh manure to vegetable beds, particularly during the spring and summer. *Credit: 3 inches*
- Incorporate compost into soil between crops (after one spent crop is removed and before the next one is planted). *Credit: 1 inch*



Water Efficiently

Many Bay-Wise Marylanders take steps to reduce water loss by mulching and using drip irrigation. Irrigate only when your garden needs it. Since fruit & vegetable plants are 75 to 90% water, they require a regular watering schedule. Efficient watering is an important key to reducing runoff and maintaining a healthy Maryland garden.

Actions:

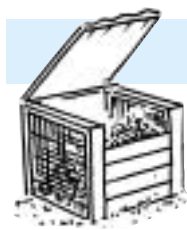
- Vegetable plants require 1 inch of water each week for optimum growth. This water may be supplied by rain or irrigation. Set up a rain gauge to measure water. *Credit: 1 inch*
 - * Water in the morning to conserve water (watering during the heat of the day causes high losses to evaporation). Morning watering also reduces potential disease problems (evening watering encourages diseases). *Credit: 1 inch*
 - When irrigating, apply 1 inch per application, (30 to 60 gallons per 100 sq. ft.) but never more than the soil will absorb. Stop watering when water begins to run off. Long, slow soaking applications are good. Short, frequent, shallow applications are bad for plants - it encourages a shallow root system, which makes plants more susceptible to drought damage. However, quick growing, succulent greens with shallow root systems will require more frequent irrigation. *Credit: 1 inch*
 - * Direct water to the soil at the base of the plant. Excess water on the leaves increases the potential for foliar diseases. *Credit: 2 inches*
 - Occasional overhead watering, during hot, dry weather, can help to cool the plants and provide moisture for beneficial insects & spiders. Water overhead in the morning only. This allows time for the leaves to dry before disease can set in. *Credit: 1 inch*
 - Provide adequate moisture during the critical times of the plant's life: during the first few weeks of development, immediately after transplanting and during development of the edible plant parts. *Credit: 2 inches*
- For gardens that use an irrigation system (in-ground or hose-end sprinkler)
- * Calibrate your irrigation/sprinkler system to apply no more than 1 inch of water per application per week. *Credit: 1 inch*
 - * Install a rain shut-off device on your automatic sprinkler system. The shut-off device will override your system's timer when an adequate amount of rain has fallen. *Credit: 1 inch*
 - Use a soaker hose or drip-irrigation system to conserve water in garden beds. Cover soaker hoses with mulch or soil. *Credit: 1 inch*
 - Check all fittings and connections for leaks; fix leaks. *Credit: 1 inch*

Plant Wisely

Plants suited to your site will require minimum amounts of water, fertilizer and pesticides.

Actions:

- * Most fruits and vegetables require a minimum of 6 to 8 hours of sun. Site the garden where it will get the maximum amount of sun. *Credit: 1 inch*
- * Locate the garden away from trees - especially walnut trees. Tree roots will compete, (and usually win,) with vegetables for water and nutrients. *Credit: 1 inch*

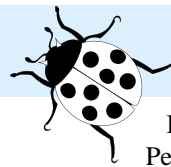


Recycle Yard Wastes

In a Maryland garden, organic kitchen scraps, such as vegetable & fruit peelings, egg shells and tea & coffee grounds, grass clippings, fallen leaves and yard trimmings should be recycled rather than thrown away.

Actions:

- Use fallen leaves, dried grass clippings and pine needles found in your yard as mulch around fruits and vegetables rather than bagging and discarding them. They make an attractive, natural mulch and they're free. Pine needles are great mulch for blueberries, an acid-loving fruit. *Credit: 1 inch*
- * Create and maintain a compost pile with collected clippings, leaves and kitchen scraps - no animal products, please. (Check your local county ordinances to see if kitchen scraps can be used.) When collecting materials for your compost pile, avoid diseased plant material. *Credit: 2 inches*



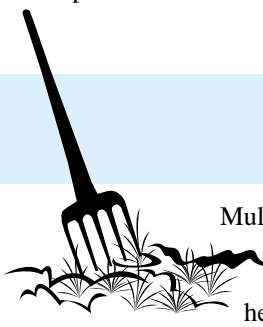
Manage Garden Pests with Integrated Pest Management (IPM)

It's unrealistic to strive for an insect and disease-free garden. Pesticides may provide effective treatment of serious pest problems, but they should not be used routinely or indiscriminately. Improper use of pesticides can result in pest resistance and can harm humans, pets, beneficial organisms and ground water. Integrated Pest Management (IPM) is a comprehensive process used to manage pests. It involves an understanding of the life cycle of potential pests and the ability to accurately diagnose plant problems. Half of all observed plant problems are not caused by insects or disease. They are caused by cultural and environmental factors.

The steps of IPM include regular monitoring for signs of plant problems and insect pests (use a hand lens for a closer look and don't forget the undersides of the leaves). Identifying pest problems and preventing them before they occur is the best means of control. If pesticides are warranted, select "bio-rational" materials like insecticidal soap, horticultural oil, and B.t. (for caterpillar pests) first. Something non-toxic to you and the environment.

Actions:

- * Avoid routine applications of pesticides. Applying insecticides is always the last resort. Treat only affected plants rather than spraying your entire garden. *Credit: 1 inch*
- * Check plants regularly. Make it a habit to walk around your garden at least once a week to observe signs of problems. Look at leaf surfaces and undersides for any insects, egg masses or disease problems. *Credit: 1 inch*
- Learn to identify three beneficial insects that provide natural control of harmful pests. List them _____ & _____.
Hint: a praying mantid is not necessarily beneficial - it will eat beneficial insects as well as pests; but it does indicate an environment where few harsh pesticides are used. *Credit: 3 inches*
- * When necessary, use environmentally friendly pesticides such as horticultural oils, soaps, Bacillus thuringiensis (B.t), and botanical insecticides like neem whenever possible, as an alternative to harsher pesticides. Use traps, barriers or other non-toxic means also. These effective, safer materials can control many pests and disease problems without the use of pesticides. *Credit: 4 inches*
- Hand pick insect pests, including egg masses and diseased leaves off plants rather than using a pesticide. *Credit: 2 inches*
- Use floating row covers to exclude insect pests on vegetables. When using them, on flowering and fruiting crops, remove during blooming period to ensure pollination. *Credit: 2 inches*
- Remove plant debris and diseased plants to prevent the spread of disease from one season to the next. *Credit: 2 inches*
- Choose insect and disease resistant varieties to reduce potential need for pesticides. *Credit: 2 inches*
- If deer, groundhogs or rabbits are a problem in your garden, use fencing or repellents to deter or repel them. *Credit: 2 inches*
- Attract beneficials to your garden by planting beds with members of the mint, aster, Queen Anne's Lace and cabbage families. These plants produce small flowers that provide habitat and a nectar and pollen source for beneficials. *Credit: 1 inch*



Protect the Soil with Mulch or Cover Crops

Mulching retains soil moisture, moderates soil temperature and helps prevent erosion and weeds. By mulching the garden you'll use less water, have healthier vegetable plants and fewer weeds. Cover crops hold soil in place, add organic matter and enhance the soil food web.

Actions:

- * Maintain a 2- to 6-inch layer of organic mulch (straw, leaves, newspaper, grass clippings, compost) over the roots of vegetables in planting beds. Deeper mulch may prevent water from filtering down to the plant roots. *Credit: 2 inches*
- Avoid cultivating the soil when it is too wet, it damages the soil's structure. Squeeze a handful of soil-if it remains in a ball and does not easily break apart it is too wet; if it breaks apart it is ready for cultivation. *Credit: 2 inches*
- Create pathways to walk on between garden beds. This prevents soil compaction in rows and encourages plants to have a healthy root system. *Credit: 2 inches*
- * After the growing season, prepare vegetable beds for winter by incorporating materials such as compost, aged manure, ground-up leaves, straw, shredded newspaper, and grass clippings in the fall. Incorporating these amendments in the fall allows the winter freeze and thaw cycles to help break them down into compost by the spring. *Credit: 4 inches*
- * Plant a cover crop, such as oats, winter rye, winter wheat, crimson clover or hairy vetch, in September. Incorporate the vegetation into the soil in the spring, two weeks prior to planting. *Credit 2 inches*