Wildlife Gardening for Natural Pest Control

City of Kirkland - Natural Yard Care – Saturday, October 8, 2016

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seattle tilth

Understanding Integrated Pest Management

Definition:

"IPM is an approach to pest control that utilizes regular monitoring to determine if and when treatments are needed. IPM employs physical, mechanical, cultural, biological and **educational** tactics to keep pest numbers low enough to prevent intolerable damage or annoyance. Chemical controls are used as a last resort, and the least-toxic chemicals are preferred." From IPMopedia / Toxipedia

Why IPM?

- Pesticides are by design toxic and meant to kill things
- Increase in pesticide use over the course of agriculture has not netted an increased benefit in pest management
- Lawns cover an area measured as 40.5 million acres (2008)
- In 2007 total pesticide use in U.S. = 78 million pounds
- Top pesticides used were herbicides, 2,4-D - broadleaf weed killer on lawns and glyphosate - non-selective weed-killer in the landscape
- Ratio of pesticide use by homeowner on their lawns compared to agricultural use = 10 to 1.
- Pesticide use poses threats to non-target organisms – aquatic, insect and mammal
- Risk to humans = toxicity of the material used and length and intensity of exposure to that material

What's in That Pesticide?

- 5% active Ingredient versus 95% inert ingredients
- Inert ingredients can also be harmful - not required to be listed on the label
- In some cases inert ingredients are considered "trade secrets"
- Use your resources to learn about pesticides
    - Safety Data Sheets – aka Material Safety Data Sheet
    - Grow Smart, Grow Safe website
    - Washington Toxics Coalition
    - Northwest Coalition for Alternatives to Pesticides – NCAP
- Neonicotinoids and bees – multiple cases of large bee die offs in response to exposure to pesticides in this group.

IPM Steps

- Prevention
- Monitoring and Observation
- Intervention

Prevention

- This is the main work of gardening
    - Mulch - prevent weeds, maintain soil moisture and moderate soil temperature
    - Improve soil – test soil, add compost, fertilize properly, use cover crops
    - Plant right plant in right place
    - Remove diseased or pest infested plant parts
    - Avoid overcrowding – prune for air flow, don't plant too closely
    - Water in the morning – deeply and slowly and avoid wetting foliage
    - Rotate vegetable crops – especially tomato, onion and cabbage family

- Plant a diverse garden to encourage beneficial insects and helpful wildlife – they will help manage pests
- Use floating row cover to prevent insect damage
    - Imported Cabbage Worm and cabbage family
    - Carrot Rust Fly and carrot family
    - Leaf Miner and Chard family
    - Peas and pea leaf weevil
- Silver flashing, mulch and flea beetle
- Set up slug and snail traps – beer or yeast in containers around susceptible plants

Monitoring and Observation

- Detective work! Observe your garden all year long
- Learn about your plants needs and the issues they might be prone to
    - Native habitat
    - Mature size and shape
    - Soil, sun and water needs
- Learn about common pest, weed and disease issues – **know their life cycles**
    - Complete and simple metamorphosis in insects
        - Stink Bugs – simple – egg to nymphs to adult
        - Imported Cabbage Worm Butterfly – complete – egg to larvae to pupae to adult
    - Annual, biennial and perennial weeds
    - Tap roots versus fibrous roots
    - Fungal, bacterial, viral diseases

- Learn to tell the difference between pests and beneficial insects
    - Pests damage your plants
    - Beneficial insects eat or parasitize pests
    - Some beneficial insects have life stages that also eat your plants – learn tolerance for these stages
- Keep a notebook – track your observations
- Practice tolerance – is their enough need to intervene?

Intervention

- Assess your tolerance levels for any given issue – clover in the lawn, rhododendron root weevil, aphids on kale
- Review plant placement guidelines – maybe plant is in the wrong place?
- Assess for a problem plant that needs to be removed
- Review your plant care practices – pruning, more or less water, fertilizer?
- Treat the issue
    - Cultural
    - Mechanical
    - Biological
    - Chemical

Cultural

- Adjust watering practice
- Prune out to provide air flow
- Use fertilizer if needed
- Remove mulch from base of plant
- Improve soil drainage
- Add compost to improve water retention

Mechanical

- Remove the pest – squish, toss, spear, salt, flick, spray with water
- Pull the weed – hand tools designed to pop out weeds, moisten soil before pulling, catch before they go to seed
- Many weeds are edible – learn which and eat your weeds!

Biological

- Employ beneficial insects – purchase and release or build habitat
    - Ladybeetles, green and brown lacewing, hoverflies, parasitoid wasps and flies, soldier beetles, minute pirate bugs, beneficial nematodes
- Pesticides developed using microbial agents
    - Btk or *Bacillus thuringiensis* subspecies *kurstaki* - controls tent caterpillar
    - Bti or Bacillus thuringiensis israelensis – controls mosquitoes
    - Developed from soil dwelling bacterium
    - Can be considered chemical control

Chemical

- Use as a last resort
- Use lowest toxicity products first
    - Soaps – Potassium fats of fatty acids – purchase or make
    - Oils – herb oils, dormant oil (petroleum based)
    - All pesticides can have off target harmful effects
        - Soap and oil are harmful to aquatic animals when they get into waterways
        - Not selective to the pest you are targeting – neonics and bees

    - Choose certified organic products – USDA, WSDA, OMRI, Oregon Tilth and other certifying agencies
    - Avoid toxic pesticides
- Read and follow all label instructions including mixing instructions, which plants you can apply to and for which pests
- Find the MSDS for each product you purchase

Creating a Wildlife Friendly Garden

Build Habitat – one of the most crucial things you can do to encourage wildlife

- Plant diverse sizes and shapes of plants to accommodate diverse wildlife
- Plant diverse species of plants which will attract different types of wildlife
- Don't be overly tidy – leave some wild spaces for wildlife
    - Hollow reed stems for solitary bees
    - Seeded flowers for birds
    - Un-mulched ground for ground dwelling bees
    - Leave moss intact for bird nests
    - Provide larval food plants for butterfly caterpillars – tolerate damage as they need to eat the leaves!
        - Milkweed for Monarchs
        - Willow for Western Tiger Swallowtail
- Plant dense areas for shelter – birds need places to escape from predators
- Provide snags, wood blocks, rock piles for basking, nesting and safe sites
- Provide a water source – puddles for butterflies, fountains or baths for birds

Plant to Attract Common Pollinators

Pollinators will help fruiting plants produce

- Birds - Hummingbirds – Anna's (year round) and Rufous, nectar plants
    - Tubular flowers –honeysuckle, snapdragon, sage, hollyhock
    - Red flowers – fuchsia, flowering currant, weigela,
    - Native plants – dogwood, madrona, twinberry, salmonberry
    - Plant early to late bloom for Anna's hummingbirds
- Butterflies and Moths – Day and night flyers, nectar plants
    - Short tubular flowers – mint, marigold, oregano, lupine
    - Fragrant flowers – lilac, lavender, dianthus, wallflower
    - Flat flowers – aster, angelica, dill, calendula
    - Native plants – maple, madrona, Douglas fir, salal, twinberry
- Bees – Solitary and social, ground and aerial nesters –
    - different species have different needs
    - native flowering plants are important– including forbs

Plant to Attract Beneficial Insects

Beneficial insects will help manage pests

- **Daisy Family** Common garden flowers – some are edible - Calendula, Cosmos, Dahlia, Echinacea, Marigold, Rudbeckia, Sunflower, Zinnia
- **Mint Family** Common kitchen herbs- Mediterranean plants – Lavender, Rosemary, Sage, Thyme, Mint, Oregano, Marjoram
- **Carrot Family** Common kitchen herbs – Dill, Fennel, Parsley, Cilantro/Coriander, Lovage, Angelica, Sweet Cicely

General Advice for Attracting Pollinators and Beneficials

- Use native flowering plants – native fauna recognizes native flora
- Plant in groupings to maximize effect – 3 foot diameter or square area
- Include plants that bloom in three seasons – spring, summer and fall
- Intermix flowering plants with edible plants
- Plant cover crops and let them bloom – crimson clover, buckwheat and Phacelia

Plant to Attract Other Beneficial Wildlife

Wildlife will help manage pests

- **Bats** – night blooming flowers, white flowers, scented flowers

  Bats can eat 1,000 insects per hour!
- **Snakes** – tall grasses and rock areas to provide shelter and basking sites

  Snakes eat slugs!

Resources

Books

- Living with Wildlife in the Pacific Northwest– Russell Link, University of Washington Press
- Wildlife of the Pacific Northwest – David Moskowitz, Timber Press
- Gardening with Native Plants of the Pacific Northwest – Arthur R. Kruckeberg, University of Washington Press
- Attracting Native Pollinators – Xerces Society, Storey Publishing
- Gardening for Butterflies – Xerces Society, Timber Press
- Insects of the Pacific Northwest – Pete Haggard and Judy Haggard, Timber Press
- Attracting Beneficial Bugs to Your Garden – Jessica Walliser, Timber Press

- American Wildlife and Plants, A guide to Wildlife Food Habits – Alexander Martin, Herbert S. Zim and Arnold L Nelson, Dover Publications

Native Plant Sources

Go-Native King County https://green2.kingcounty.gov/gonative/index.aspx

King Conservation District Plant Sales http://kingcd.org/programs-native-walk-up-sale.htm

General Help

Garden Hotline www.gardenhotline.org 206-633-0224

Monday through Saturday 9:00 am to 5:00 pm