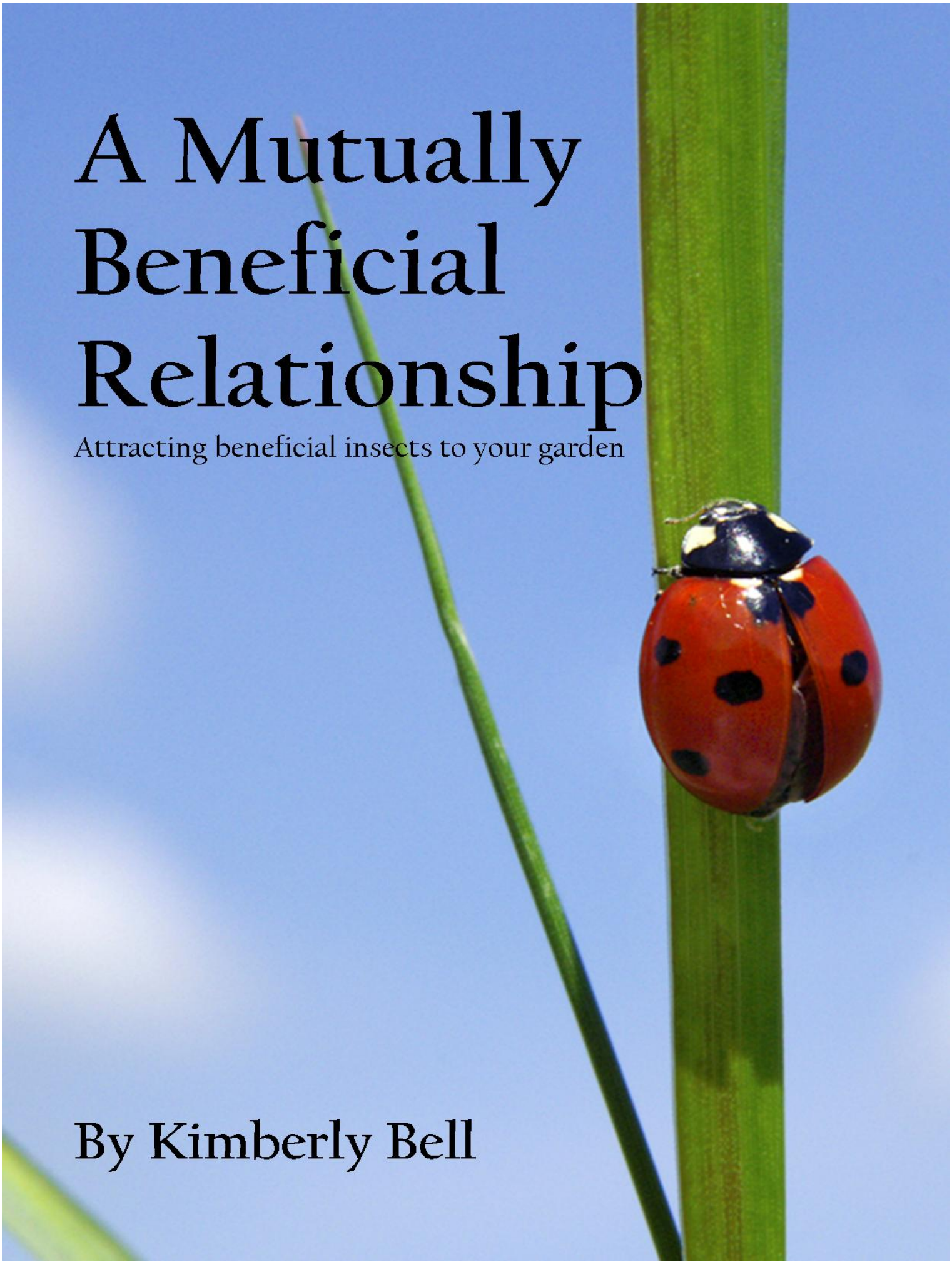
A Mutually Beneficial Relationship

Attracting beneficial insects to your garden



By Kimberly Bell

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There are possibly millions of insect species in existence in the world. How do we know if the tiny little creatures in our landscape are friends or foes? If we have insects like these guys, we are very

APHIDS

EARWIGS

CUCUMBER BEETLES

likely to see damage to flowers, leaves, fruit and vegetables. Once damage is found and the damaging pests are seen, we have some choices. We can: 1) ignore the insect pests, 2) pick them off, 3) use insecticidal soaps, 4) spray pesticides, or 5) attract beneficial insects to the landscape to help provide some defense against the unwanted pests.

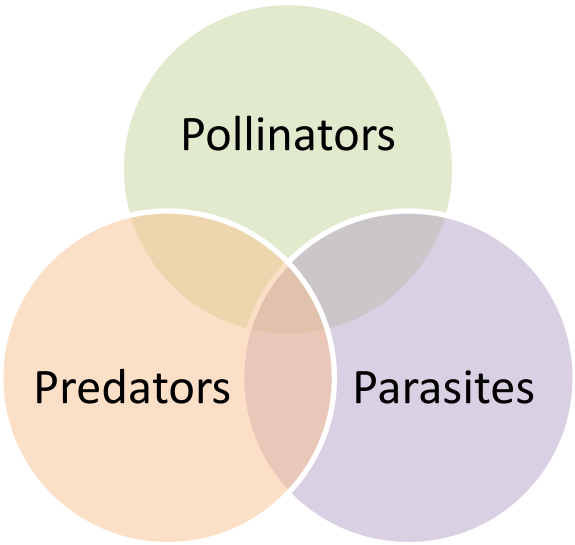
For hundreds of years, beneficial insects have been encouraged to stay in gardens and protect them from unwanted pests. Insectaries were maintained by farmers to attract beneficial insects with the nectar and pollen they need so that they might provide protection for the farmer's crops. However, today with the wide use of pesticides, both the unwanted pests and the beneficial insects have been killed. Unfortunately, many pests have developed resistance to pesticides, but many of the beneficial insects have not. The result has been that the pest problem has increased.

Is it even possible that beneficial insects can make a difference? Yes, definitely! It's a small percent of insects that are actually troublesome.

"Approximately 1 million insect species have been described, more than 90,000 of them in North America. It is believed that as many as 10 million may exist worldwide. The greatest numbers of species belong to the beetle, fly, moth/butterfly, and wasp/ant/bee orders. Fewer than 1 percent of all insect species are serious pests that affect humans, their animals, crops structures, or fiber." Arthur L. Antonelli, Extension entomologist, Washington State University

Fortunately for all of us, most insects are either beneficial or harmless. But, unfortunately, the little critters do not wear signs, "I'm good" or "I'm bad." It can be difficult to distinguish the good from the bad, and it takes time, observation and some resources to begin identifying insects. Various university sites on the internet have helpful insect identification databases, and local county extension offices often have amateur entomologists who are happy to offer their help in insect identification. Once we have identified the problem, we can begin to look for the beneficial insect that might be able to offer some help in controlling the insect pests which are causing damage. Each beneficial insect is attracted and sustained in the garden a bit differently; therefore, the more we study and learn, the more we can incorporate an entire biological control system against unwanted insects. Designing and creating an insectary in our home landscape can become an important element in keeping the population of insect pests under control.

Beneficial insects fall under 3 different categories:



- The pollinator. Without pollinators, fruit, vegetables and the production of seed would be dramatically decreased. Pollinators play a vital role in producing the food we need. The best known pollinators are bees.
- The predator. The predator may be a larvae or adult which feeds on other insects. Spiders and praying mantids are very effective predators and are general feeders. Lady bugs (lady beetles) and lacewings are also predators, and their larvae are especially effective hunters.
- The parasite. The adult insect lays eggs in or on the host insect and when the eggs hatch, the larvae feed in or on the host insect. The adult parasite insects feed on pollen, nectar or other food sources, but not on insect pests. Common parasites are small wasps.

PRAYING MANTIDS


HONEY BEES

TRICHOGRAMMA WASPS

The best way to have an abundance of beneficial insects in our home garden is to attract them. By providing the food that beneficial insects need, they are much more likely to stay in our garden where they can help keep the pest population under control as well as increase our yields of fruit and vegetables. Let us examine pollinators, predators and parasites more closely and how to attract all three into our landscape.

POLLINATORS

Pollinators are probably the first beneficial insect that we think of. Without pollinators, our food resources would be drastically reduced. Pollination is required to produce seeds and fruit in up to 80 percent of the world's flowering plants, including 2/3 of the world's food plants. It would be difficult to imagine our food choices without food plants!

Pollinators are mammals, birds, insects and other invertebrates. Examples are bats, hummingbirds, butterflies, moths and of course bees. Flowers provide a reward for the busy, hard-working pollinators. Pollinators eat the nectar that is sweet and provides them with energy and the pollen which is their source of protein. As they fly from one flower to the next, looking for the reward, they carry the sticky pollen from flower to flower. Pollination ensures the completion of a flowering plant's life cycle and allows seeds and fruit to be produced.

Bees are the best pollinators. Their tiny body was designed to pollinate. Body hairs and back-leg baskets carry pollen from male to female flower parts. Even the bee's buzz helps pollinate as it agitates flowers to release their pollen. For thousands of years, bees have been valued in agriculture. Today, we can drive past an orchard or field of clover and see the white wooden boxes containing the farmer's most valuable tool. Bees are also valuable in our residential gardens and they can bolster the health and productivity of the home garden.

So, how can we help the pollinators in our area? Here are a few suggestions:

- Protect the Pollinators. If we use pesticides in our yard, we may be hurting beneficial insects like bees.
    - If possible, keep our yard and garden a pesticide free zone.
    - If pesticides need to be used, apply during late afternoon or evening since bees typically are active during the morning hours.
    - Avoid spraying flowers.
    - If the pesticide is available in both liquid and powder, choose the liquid. Powders are more likely to stick to the bee's body and possibly be transported back to the hive.
    - Use the least toxic. Examples would be soaps, oils and *Bacillus thuringiensis* (Bt) and spinosad.
- Provide Habitat for Pollinators:
    - Provide nest building materials for bees such as dead tree limbs. Also, some bees and wasps require mud as nest-building material. Bamboo can be bundled and tied to tree trunks to attract cavity nesting bees.
    - Provide nest sites and overwintering sites. Leaving leaves, twigs and brush in small piles in the yard can provide suitable overwintering habitat. Bare spots in the garden may attract soil-nesting species. Bumble bees often look for holes in the ground for their nests.
    - Provide water. Birds, bats and butterflies require a water source. Puddles from the hose can be sufficient or make a simple watering hole with a saucer and rocks. Keep it full of water on dry days.

MINT

COSMOS

DILL

- Provide food resources … flowers, flowers and more flowers!
  - Dedicate 5 – 10% of our garden space to growing flowers to attract beneficial insects.
  - Grow flowers in bunches. Clumped plantings appear to be more attractive to pollinators than individual flowers randomly dispersed.
  - Offer a variety of heights and forms. Low-growing sedum ground cover and tall cosmos are a good example of height differences. Umbels and composite flowers provide the most attractive sources of food. The tiny, clustered flowers of umbels offer exposed nectar and pollen.
  - It's important to have flowers in bloom throughout the season especially early in the season.
  - Flowers that are attractive: asters, alyssum, baby blue eyes, basil, cilantro, cosmos, crimson clover, dill, fuchsia, impatiens, mints, queen anne's lace, single-petal marigold, nasturtiums, sedum, sunflowers and zinnia.
  - Shrubs and trees that are attractive: dogwood, fruit trees, raspberries, red maple, sumac and willows.
  - Hummingbirds tend to like red flowers with long, tubular shapes.
  - Butterflies are also attracted to red and orange flowers.
  - Moths, many of which fly at night, are attracted to pale flowers that reflect the moon.
  - Bees are red-blind. They see flowers in colors of yellow, blue-green, blue, violet and ultraviolet.

It's a learning process to see the value in an insect and to know their important role in the cycle of flowering plants. The learning process helps us move beyond our natural inclination to swat them or squash them. When we appreciate them and create habitat that will attract them and sustain them, they in turn will help make our garden more productive and healthy. It feels good to do our individual part to help make our landscape wildlife friendly!

PREDATORS AND PARASITES

These “good guys” are crawling and flying creatures whose diet consists mainly of the pests that ravage garden plants and ornamentals. These beneficial insects are more effective than we could ever hope to be at keeping insect pests under control. Once we’re familiar with the good bugs, we can look out for them and even attract them by providing a diverse population of flowering plants.

Flowering plants attract beneficial insects and nourish them. Having flowers will increase the likelihood that the insects will colonize our garden and lay eggs. After hatching, the young will crawl and feed on pests such as aphids, caterpillars, leaf beetle larva, thrips, spider mites and whiteflies. Most annuals that attract insects will flower about 8 - 12 weeks after germination, so plant small batches of seeds every 3 – 4 weeks. Deadhead flowers to extend the flowering period. Flowers provide beneficial insects with some very important resources:

- The sugar in nectar gives them fuel for searching for prey, mating and egg-laying
- The protein and fats in pollen are used to support egg development
- The flower is used as a place to locate mates
- Small prey that live in flowers, such as thrips, are a food source for young predatory insects

Let’s learn about the bugs! Here’s a list of 10 beneficial insects that can be attracted to the home landscape to help control the pest population.

1. Lacewings. These are beautiful little green or brown insects with large lacy wings. They are predators, and both the adults and larvae, which look like little alligators, destroy pests like aphids, mites and other small insects and insect eggs. Attract lacewings by planting Fern-leaf Yarrow, Dill, Angelica, Coreopsis, Coriander, Queen Anne’s Lace, Cosmos and Fennel.
2. Ladybugs. Also known as ladybird and lady beetle. Adult lady beetles eat aphids, larvae and eggs of mites, moths and beetles. In its lifetime, a lady beetle can eat more than 5,000 aphids. Lady beetle larvae have a voracious appetite for aphids and other insects. Attract lady beetles by growing Angelica, Yarrow, Ajuga, Marigolds, Daisies, Asters, Dill, Veronica, and Buckwheat.

LACEWINGS

LADYBUGS

3. Hover Flies. Also called syrphid fly and flower fly. The adults look like little bees that hover over and then quickly dart away, but they do not sting. Their eggs hatch into half-inch maggots that eat aphids,

mealybugs and other pests. Hover Flies are also pollinators. Attract hover flies with Yarrow, Spearmint, Wild Bergamot, Sweet Alyssum, Golden Marguerite, Dill, Feverfew, English Lavender, Sedums, Thyme, Statice, Zinnias.

4. Parasitic Mini-Wasps. They do not sting, but instead, the females have adapted their stingers so they can lay their eggs in the bodies of insect pests. The eggs then hatch, and the young feed on the pests from the inside out, killing them. After the young have killed the pests, they leave hollow "mummies." Moths, beetles, fly larvae, moth eggs, and various insect pupae and adults are all targeted. Plants to grow include Yarrow, Dill, Golden Marguerite, Caraway, Coriander, Cosmos, Pennyroyal, Marigolds, and Lemon Balm.

BIG EYED BUGS

HOVER FLIES OR SYRPHID FLIES

5. Tachinid Flies. These parasites target different caterpillars and bugs. White eggs are deposited on foliage or on the body of the host, and the larvae are internal parasites, feeding within the body of the host. Plants that will attract these flies are Golden Marguerite, Lemon Balm, Buckwheat, Pennyroyal, Lacy Phacelia and Thyme.
6. Minute Pirate Bugs: These tiny little bugs will feed on almost any small insect or mite, including thrips, aphids, mites, scales, and whiteflies.
7. Damsel Bugs: They are dull brown and blend in well with their environment, and they feed on aphids, leafhoppers, and small caterpillars.
8. Big Eyed Bugs: These oval shaped bugs with large eyes feed on leafhoppers, spider mites, insect eggs and mites. Plants that are attractive to Minute Pirate, Damsel, and Big Eyed Bugs are Caraway, Cosmos, Fennel, Alfalfa, Spearmint and Marigolds.
9. Ground Beetles: They are nocturnal predators keeping the night time pests (slugs, snails, and cutworms) under control. Ground beetle adults are dark-colored and often have a metallic sheen, but it's really the larvae that are the pest controllers. During the day, they dig down into the mulch and organic matter. The best way to attract ground beetles is to mulch and plant low-growing ground covers like thyme, savory, and strawberries. Also, stepping stones or rocks in the garden give them a place to hide out underneath.

GROUND BEETLE

10. Praying Mantids: These large insects are difficult to spot because they are perfectly camouflaged among garden plants. They are hungry predators, but unfortunately, they are just as likely to eat a beneficial insect as they are to catch a caterpillar. Having a well-planted flower garden is all Praying Mantids need. They hide out amongst the flowers and foliage.

Following a few basic gardening practices will help ensure that beneficial insects are being attracted to our garden. If we avoid spraying pesticides, mulch, and diversify our plantings so that we have a succession of flowers throughout the growing season, there is a great chance that many of the good bugs will be calling our garden "home." If we see any of these good guys hanging around, we are doing something right!

BUILDING A POPULATION OF BENEFICIAL INSECTS

Building up a population of beneficial insects takes time. A common question that is asked: "Should I purchase lady bugs or praying mantids for my yard?" There's no simple yes or no answer to that question. In the case of lady beetles, in the process of collecting, packing, storage and release, many beetles are so injured they are no longer effective predators. Many are killed as well. Also, unless there are plenty of pests in our home yard, lady beetles will not stay. They will simply fly away to a place that has more food or just fly based on their natural instincts. If we do purchase lady beetles, release them at sundown at the base of aphid-infested plants. It is helpful if the ground is dampened first and mulched as this will give them a humid hiding place.

The egg sac of a praying mantid is called an ootheca. Ootheca egg cases can be purchased during the winter and the mantids will hatch and be ready to be released in the spring. Mantids are cannibalistic and territorial; therefore, it is best to have a yard full of unwanted insects to keep the mantids happy in their own space. In general, praying mantids are great for observing and entertainment, but they are not the most effective predator to purchase for our garden.

There are nearly 50 beneficials that can be purchased for release. Examples include: lacewings, ground beetles, predatory stink bugs, spiders, wasps, dragonflies, damselflies, fireflies, predatory mites, minute pirate bugs, assassin bugs and predatory nematodes. The insects are shipped in an inactive state (like the ootheca), and there are directions on how to successfully release them. Once they are released, they need to have shelter, water, food sources and a pesticide-free environment. Given time, they will prey upon the unwanted pests – either in our garden or our neighbors'. If there is an infestation of pests, purchasing and releasing beneficial predators can be an effective control method.

A pollinator that is available for purchase is the Orchard Mason Bee. This little bee is native and found throughout most of North America. These beneficials do well in urban areas and are gaining in popularity with many gardeners who collect the bees by providing a habitat for them and encourage their populations to grow. Unlike beneficial predators which are apt to fly away, Orchard Mason Bees have a fairly small range for their foraging, so they are likely to stay within 100 – 200 feet of where their habitat structure is.

The Orchard Mason Bee is an excellent pollinator for spring fruit trees, berries, flowering shrubs and a wide array of flowers. It is smaller than a honey bee, a blue-black metallic color, and it is gentle and non-aggressive making them perfect for the home garden and orchard. These early pollinators do not live in hives. They build nests in hollow stems, woodpecker holes and insect holes found in trees or wood. They are not social bees in that their nests are not shared nor do they help provide for or protect each other's young. They do not produce honey, but the bees are fascinating to watch and enjoy, and they will work away in our landscape producing a more bountiful yield of fruit and berries. There are several university websites that provide helpful information in the life cycle of the bees and how to build their habitat structures.

ORCHARD MASON BEE

There is much more that could be written about this wonderful topic of beneficial insects and how to welcome them into our landscape. It's not a simple 1,2,3 process to attract and sustain a population of good bugs. It takes motivation, patience, and knowledge to create a friendly yard and garden. By designing our yards and gardens with the beneficial insects in mind, we are forming an alliance with them. We form a mutually beneficial alliance for both our gardens and for the insects, and in the process we gain insight into and respect for the natural cycle of life. Sure, there may be some effort involved and some new information to gather, but there could not be a better reward.

GOLDEN MARGUERITE

CRIMSON CLOVER

LACY PHACELIA

QUEEN ANNE'S LACE