



Ecosystems and Pest Control

Ecosystem-Design Approach

This method, also called Ecosystem Gardening is based on the idea of creating a complete ecosystem in your garden space to encourage balance and natural checks and controls.

The benefits of the ecosystem-design approach go beyond having a more successful garden. This method helps to purify water and air; produce more oxygen; preserve the soil; control agricultural pests; provide aesthetic beauty and much more!



COMPONENTS OF ECOSYSTEMS

SOIL

Quality **soil** is one of the most valuable resources for any gardener. A healthy and abundant ecosystem begins with and depends on your soil.

- Soil is made up of several different **particles** and **nutrients**.
- Soil is home to **millions of microorganisms** who play critical roles in the health of your plants.
- **Organic material** in the soil breaks down, releases nutrients and forms humus which helps with water retention.

The quickest way to improve your soil is to add **compost** to the existing area. Ideal soil will take time to build.

WATER

Ecosystem Gardening can help conserve and purify water by implementing any of these elements:

- **Rainwater catchment** reduces the need to use clean, drinking water from the hose, lowers your water bill and diverts the amount of runoff created during a rainstorm. Your garden crops may even prefer the pH of the rainwater over our more alkaline city water.
- **Drip irrigation** is a great way to save money in the garden. This type of irrigation will deliver the water directly where the plant needs it—at the base of the plant. You will end up using less water from the hose and lose less water to evaporation.
- **Mulching** with straw or leaf mulch will help prevent evaporation and keep your soil moist for longer. At the end of each season, any decomposed mulch can be turned into the soil to increase the organic matter and nutrients for the next set of crops. Mulch is also a great home for spiders and other beneficial insects and provides a dry surface on which your produce can rest.



INSECTS

Insects are often thought of as something to be removed from the garden because some of them cause damage to our plants. However, the majority of insects, bugs and spiders are **beneficial**. Some are **pollinators**, some are **predators** and some provide a **meal** to larger animals.

Common North Texas Pests include aphids, cabbage loopers, caterpillars, cucumber beetles, flea beetles, harlequin bugs, horn worms, leaf-footed bugs, pill bugs, slugs and snails, spider mites, squash bugs and squash vine borers.

Common North Texas Beneficials include lacewings, ladybugs, nematodes, parasitic wasps, pollinators, praying mantis, assassin bugs and spiders.



WILDLIFE

It is easy to forget about larger animals and the role they play in the garden ecosystem, especially in an urban setting. Larger animals are attracted to the garden for a variety of reasons: **food, water, temporary shelter** or **long-term housing**. Some of the most helpful garden animals are **birds, bats, snakes, lizards** and **turtles**.

The benefits of allowing a diverse set of wildlife to participate in your garden include controlling insect and rodent populations, spreading seeds, pollinating crops, adding beauty and contributing fertilizer.

PLANTS

The idea is to copy nature's blueprint or use the nature that already exists in your garden space to create your ecosystem.

- **Canopy** of tall trees will attract birds and mammals.
- **Smaller trees** attract small birds, lizards and insects.
- **Small plants and shrubs** provide shelter for insects and lizards.
- Using your garden space to the fullest with **herbaceous** plants, **root vegetables**, **ground cover**, and **climbing plants** will provide protection for your soil and wildlife.
- Identify **microclimates** in your garden space where different plants may thrive. You may have cool, shady corners; open, windy spots; or spaces where water pools.
- **Plants that deter and attract insects** include caraway, fennel, marigold, mint, buckwheat, chamomile, cilantro, dill, lavender, lemon balm, oregano, parsley, thyme, yarrow, catnip, tansy, sunflowers, anise, borage, aster, basil, chives, geranium, hyssop, rosemary, eucalyptus, garlic, onion, radishes, peppermint, nasturtiums, rue and mums.

Increasing the diversity among your plants will increase the diversity of wildlife present in your garden.

CONCLUSIONS

- Gardening does not happen in a bubble. Your garden is an **ecosystem**. The more balanced and diverse it is, the better it can take care of itself.
- Make **observations** throughout the year to monitor you garden's progress. Make notes and don't make the same mistake twice.
- Keep learning, doing research and talking with other gardeners to **increase your knowledge** of gardening.

Recommended Plants for North Texas

Canopy

- Pecan, Live Oak, Cottonwood, Eldarica Pine, American Elm, Bald Cypress, Bur Oak

Low Trees

- Chinese/Red Tip Photinia, Persimmon, Vitex, Crepe Myrtle, Desert Willow, Holly

Shrub Layer

- Blackberry, Raspberry, Rosemary, Lavender, Sunflower, Honeysuckle, Cross Vine, Pampas Grass, Pomegranate

Herbaceous

- Columbine, Daisies, Coneflower, Vegetable Crops, Ferns, Salvia, Germander, Lantana, Borage, Yarrow

Root Layer

- Onion, Beet, Carrot, Turnip, Radish

Ground Cover

- Strawberries, Creeping Thyme, Ajuga, Asian Jasmine

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