ARIZONA COOPERATIVE EXTENSION Pinal County

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MULCHING BENEFICIAL FOR PLANTS

We can prepare our plants for the heat and dryness of our Southwestern summer. One of the best ways to prevent heat and water stress damage to landscape plants is to place a surface mulch of decomposed organic matter, stones, or other material around existing plants.

What are mulches? By definition, mulches are materials that are placed on top of the soil beneath garden and landscape plants for the purpose of reducing water evaporation, preventing weed problems, and buffering soil temperatures. By comparison, soil amendments are defined as products that are mixed into the soil to improve soil tilth. All too often we rely solely on soil amendments to help us through the growing year while neglecting the important benefits of a good surface mulching program.

What do mulches do? Mulches reduce water evaporation from the surface of the soil by forming a protective barrier that keeps the sun from heating the soil. The lower temperatures not only decrease the tendency of soil moisture to volatilize and escape into the atmosphere, they also help keep the temperature of the soil around the roots at a favorable level for good root health. The mulch barrier also reduces the movement of water up and out of the soil through capillary action. The reduction of water evaporation also slows the buildup of salts at the soil surface, which results in soil crusting that can hinder seedling emergence at germination and soil temperature fluctuations that harm tender young plants.

A good surface mulch will also help reduce weed problems when it is applied in a layer that is thick enough to smother germinating weed seeds. For most weedy plants that germinate, seed, and die in one year, this often means a mulch depth of at least two inches.

For highly aggressive perennial weeds, such as Bermudagrass and nutsedge, mulching may only work for a short period during the growing season. These aggressive weeds seem to be able to grow up through just about any mulch at some time or other during the growing season. For best weed control, avoid mulches that are contaminated with seeds or vegetative parts of weeds.

Another benefit of mulching is the reduction of water stress to landscape plants. Many plants are damaged each year because soils are allowed to become too dry. Much of this damage can be avoided by using mulches to help buffer soil moisture levels.

Because mulches slow the loss of water to the atmosphere through evaporation and prevent water loss to weeds by preventing their germination, mulches help prevent the deep fluctuations of soil moisture concentrations between irrigations. This means that more water is available for the desirable plants for a longer period of time with less waste.

Many different materials can be used as mulches. For example, peat moss, composted leaves, straw,

MULCHING BENEFICIAL, Continued on Page 5

IN THIS ISSUE:

UNDERSTANDING PESTICIDE LABELS

With the weather warming up, many will soon be checking the nursery shelves for insecticide and weed killer products.

Used appropriately, pesticide products can be extremely helpful in safely solving most of our pest problems in a relatively short period of time; but selecting and using the right product for the job can be a daunting experience. The answer to this dilemma lies in the pesticide label.

Anyone who has tried to read a label on a pesticide product can relate to the difficulty in trying to understand what it is saying. The bottom line, however, is that the label contains all of the information we need to know in order to buy, use, store and dispose of the product correctly.
If we can understand what the label says, a lot of the confusion will disappear.

All pesticide products, by law, must have a label. In some cases the product will also have labeling, an information booklet that is attached to the product in some way. Labeling can also be information that is separate from the product, such as a label book, pages on a web site, or some other written documentation.

Obviously, the label and labeling can be a tremendous benefit in helping us understand how to select and use the right product for the job. It can help us to both solve our pest problem and to protect ourselves from unwanted side effects. In order for that to happen, we have to read, understand and follow the directions on the label. We must realize that the label is a friend and that, just like a good friend, it can help us through difficult times. We just have to let it help us. The very few minutes that we spend in reading the label can be the most important time that we spend in using pesticides.

Now for some specifics. The following tips will help you understand the very basic information found on the label.

You need to know that every pest control product will have at least two, and sometimes three different names on the label. The first name is the trade name; the big name on the front of the bottle. It is the name given to the specific product by its seller and the name by which most people readily recognize most pesticide products. I am not going to mention any of those names, because if I mention one, I have to mention them all, so let it suffice that the name in large print on the front of the container is the trade name.

The problem with trade names is that every company has a different name for a product. Different products from different manufacturers or distributors may have different trade names but all can actually contain the same exact chemistry. This is important to you because of cost. One company may charge a lot for the same chemistry for which another company with a different trade name may be charging much less. Save yourself a little money by comparing labels.

The next name is the common name of the active ingredient found in the product. Every pest control chemical has a name in everyday language that people can use. So, to compare labels, look at the active ingredient list and see what actually is in the product. By comparing common names and percentages from the active ingredient list, you can decide whether you are getting a good deal or not. In this column, I will be using only common names.

The last name on the label that is usually, but not always, included is the chemical name. It is also usually in the active ingredient list, but unless you have a degree in chemistry, it is difficult to read this name, let alone know what it means. A frequently seen chemical name found on a weed killing product would be “2,4-dichlorophenoxyacetic acid”. The common name is “2,4-D”, a common broadleaf herbicide.

Besides names, the label will also contain information on the type of formulation, signal words, directions for use, safety and first aid recommendations, and the EPA registration number and establishment number, which help track the specific product.

Pesticide formulation information tells the exact form in which the product is being sold. Some products are sold as solid granules that can be spread with a gloved hand or by mechanical spreader. Others are liquids or powders that must be mixed with water before they can be applied by sprayer.

Signal words, like “Keep out of Reach of Children” and “Caution” let us know that the material is a hazardous material and how toxic the material is.

The most hazardous materials made will always contain the signal word “Danger-Poison”. No home use pesticides will carry this key word because these materials are restricted and must be applied by licensed applicators.

PESTICIDE LABELS, Continued on Page 6

CONTROLLING WEEDS

Are you fighting tumbleweeds in your rock mulch landscape? Spurge in your lawn? Grassy weeds in the alley? If you can answer yes to any of these questions, you aren't alone!

Weed control is a common problem in all gardens and landscapes, and how to get rid of weeds in as painless a manner as possible is a question that I often get to answer. Let's take a few minutes and go over the basics of this important topic.

First, let's make sure that we are on the same page, definition-wise. Weeds are any plants that grow in places where we do not want them. These can be escapees from lawns and gardens, such as Bermudagrass growing in flowerbeds, or moss roses from the flowerbed growing in the neighboring Bermudagrass lawn. Other weeds are just plain unsightly, prickly or ugly. In most cases, we want them to just disappear.

The process of making weeds disappear can be expensive and time consuming. Getting the upper hand can test our patience to the limit. Sometimes we are tempted to cut corners, or grab the first tool that comes to hand, no matter whether that tool is the best choice or not. Whatever weapon we choose - our hands, a hoe or a herbicide - that weapon must be carefully considered and wisely used.

Mowing, hoeing or pulling weeds are common tools for mechanically controlling weedy plants. While mechanical weed control techniques are some of the oldest and most well known methods of getting rid of weeds, they can also be the most labor intensive, time consuming and mind numbing. Because of the intensity of labor required, they usually get put on the back burner of outside chores, especially when the thermometer hits 110°F! I like to use sturdy gloves to protect my hands if I am going to use these tools.

A less intensive way to manage weeds is to physically place a barrier between the sunlight and the weed seeds in the soil. Mulches of newspaper, stone, old shingles or other materials create a physical barrier through which it is difficult, if not impossible, for weeds to grow. It is important to cover this layer with compost or bark to reflect the hot sun. Otherwise, the accumulated heat in the soil underneath may cook the roots of the plants that we are trying to protect. These barriers do not remove existing weeds, but they help prevent future weeds from germinating.

Another way to slow down or eliminate weeds is to modify the immediate environment of the weeds in ways that encourage desirable plants. This can be done through proper soil preparation; managing soils for pH, salts, and fertility; proper irrigation management; correct plant selection; good rotation practices ; proper mowing heights; thatch control and reduction of soil compaction. These critical practices are often overlooked as weed control methods and this fact alone may account for many of the weed problems seen today.

Weeds can also be controlled with chemical weed killers, sometimes called herbicides. On the shelves on any nursery or garden store there will be huge array of different weed killing products that, for safety's sake, we must know how to select, mix or use.

The first key of selecting the proper herbicide is to understand the herbicide label. It is important to remember that every pest control product will have three different names: the trade name, the common name and the chemical name. Trade names are given to a product by the specific company that formulates and sells the product. The common name is a name given by weed scientists to easily describe a particular active ingredient and the chemical name is the name given by chemists to describe how the active ingredient molecule is assembled.

Let's now take a look at different chemical weed control options. A popular weed killing product is A2,4-dichlorophenoxyacetic acid@, a chemical name. The common name by which most people recognize this herbicide is "2,4-D". There may be many different products containing 2,4-D on the shelf at the store, all with different trade names, but the common name and the chemical name will always be on the label to help the experienced make a correct decision.

Do not forget that there are correct and incorrect times to use 2,4-D! This herbicide in the "amine" form works well during the winter months, but if the label says "ester", do not buy it! Ester formulations vaporize more readily than amine forms in warm weather, which is just about year round in Southern Arizona. 2,4-D in the vapor form can move with wind currents and later settle down on desirable, but very susceptible plants.

CONTROLLING WEEDS, Continued on Page 7

PLANT POLLINATION CRITICAL

As the weather warms and tomato blossoms fall off the plant and sweet corn kernels fail to develop on the cob, we need to discuss plant pollination, a critical, but generally unknown biological process that is absolutely essential to fruit and vegetable gardening success.

For the many garden plants that produce edible seeds and fruits, the biological process of pollination means either success or failure. Fruit producing plants like cantaloupe, tomato and apricots will often abort fruit that has not been properly pollinated and seed producing plants like beans, almonds and pecans usually end up with empty pods or shells. If plenty of fresh fruit and vegetables are important, it is critical that gardeners know about and correctly manage the process of pollination.

Pollen is the male gene-carrying particle that is produced in the anther or male reproductive structure of flowering plants. Pollination occurs when pollen is transferred, either by the wind, gravity, insects or other agents to the stigma, or female part of the flower. Under normal conditions in native environments, pollination usually is a normal function of nature, and plants are able to progress flawlessly from generation to generation practicing the law of survival of the fittest. Occasionally, however, problems can arise.

Let's look at tomatoes, for example. When pollination fails to occur, the flowers on the plant abort, that is, fall off. In a tomato, the flower stem takes on a characteristic crook behind the flower that, when touched with a finger or with the slightest breath of air, will fall off the plant. This is a pollination problem. Sometimes pollen from the male parts of the flower can be artificially transferred to the female parts by gently tapping the flowers to dislodge and move the pollen. There are also some products on the market that can also aid in the pollination process in tomatoes.

In plants where the pollen from their own male structures fertilize the female structures in the same flower, the process is called self-pollination. Garden peas, wheat, oats and cotton are examples of common plants that self-fertilize and in most cases, good pollination usually occurs. Most pollen-related problems in these plants are usually related to heat stress where high temperatures sometimes kill the pollen before a transfer of genes can occur. In home gardens, proper adherence to planting date recommendations will usually prevent pollination problems in self-pollinated garden plants.

Plants that require the transfer of pollen from one flower to another are dependent upon cross-pollination. This extra step can mean trouble. If the transfer is interrupted or prevented in any way, reproduction, and the development of fruit or seeds simply will not occur.

The exchange of pollen during the cross-pollination process is often facilitated by outside agents called pollinators. When we think of pollinators, most people think immediately of honeybees, but they do not have the field, forest or garden to themselves. Besides the honeybee, there are many other species of bees as well as other insects and animals that help spread pollen from plant to plant. Some of the more common pollinating agents beside the honeybee include bats on saguaro cacti, birds, especially hummingbirds on many long, tubular-shaped flower plants, and some wasps, flies, moths and butterflies. In addition to animal pollinators, we cannot forget that the wind also plays a major role in the cross-pollination of many plants

Generally, plants with inconspicuous flowers which lack petals, odor, and nectar are pollinated by the wind. Grasses, cottonwoods, elms, walnuts, oaks, pecans and, yes, let's not forget ragweeds, are all wind pollinated. Grouping desirable wind-pollinated plants together in blocks will help make sure that proper pollination occurs.

A good garden example is sweet corn. Because it is wind pollinated, sweet corn must be planted in blocks and not long narrow rows in the garden to ensure the best coverage of pollen onto the developing ears. Poor pollination in corn will be seen as skips between the kernels at maturity. Also, similar symptoms can also be seen when temperatures above 100 degrees F kill pollen before pollination occurs.

Although wind-pollinated plants need not concern themselves with the business of attracting pollinators, it is a different matter for plants that need more than a breezy day to assure that there is a next generation. Squash, cantaloupes and watermelons require the actual movement of pollen from the showy male flowers to the inconspicuous female flowers where the fruit develops. These flowers are in completely different locations on the plant and reproductive success is entirely dependent upon insect pollinators like honeybees to make the transfer of pollen. In the desert, these plants must

Plant Pollination, continued on Page 6

MULCHING BENEFICIAL

Continued from Page 1

stones, and even plastic sheets or asphalt shingles can be used. The organic mulches are most desirable, because these can be tilled into the soil as soil amendments at the end of the growing season.

Backyard compost and decomposed lawn clippings can be recycled into mulch, but many commercially available products are also available. Decorative bark, gravel, compost, redwood sawdust, peat moss, composted steer manure, and forest mulch products are available. Each has its place.

Yard waste used for mulching should be well composted before it is applied. Most organic materials used for mulches contain relatively low amounts of nitrogen and have a high carbon-to-nitrogen ratio, which could mean big trouble for the garden if extra nitrogen is not applied to the decomposing mulches. The soil microorganisms that aid in the breakdown of organic materials need to have their own supply of nitrogen-based food in order to complete the breakdown process. And if extra nitrogen is not added, these microorganisms will use the nitrogen found in the mulch and then proceed to steal what they can from the soil. Under these conditions, a shortage of nitrogen for the desirable plants can result.

Pea gravel lawns have become popular in desert landscapes. These layers of decomposed granite, river gravels, and other inert materials act to prevent germination of weed seeds by serving as protective mulches to the underlying soil. Black plastic is sometimes used beneath these materials to provide extra protection. Black plastic works well for weed protection when the rock mulch layers are thick enough to prevent the germination of weed seed that may have blown in on top of the plastic with the wind. Yet plastic has other problems that have made it less popular over the past few years. Plastic mulches that have not been treated to prevent sunlight degradation can break down over time and lose their effectiveness when the overlying mulches are not thick enough to prevent sunlight contact with the plastic.

Plastics can also prevent moisture from reaching the roots of trees and shrubs as they grow out from the trunk of the plant underneath the plastic. If salt problems occur, the plastic makes it difficult to bring extra irrigation water to leach the salts out of the root zone.

Because mulches work by preventing sunlight from contacting the surface of the soil, mulches that are dark in color are best. Most mulches are placed on the surface of the soil to a depth of between 2-6 inches, depending upon the material used.

Mulches used around trees and shrubs should begin a few inches from the trunk and spread outward towards the outer edge of the plants. Never apply mulch next to the trunks of trees and shrubs because crown rot and other problems can result.

It is also important to irrigate plants through the mulch as much as possible. The downward movement of water helps move organic acids from the decomposing organic materials into a position where they can help build up the structure of the soil. Drip irrigation systems, both above ground and below ground, work well with mulches.

Mulches aid in maintaining favorable conditions of the soil around garden trees, shrubs, and bedding plants. By using mulches correctly, many of the common soil problems that are all too often seen in area gardens and landscapes can be avoided.

PESTICIDE LABELS

Continued from Page 2

Pesticides which carry the signal word “Warning” are less hazardous than the “Danger-Poison” category but are more hazardous than the low toxicity products which carry the signal word “Caution”. Some insecticides sold for home use do carry the “Warning” key while many of the products carry only the “Caution” signal.

The most important information on the label will be the directions for use, safety and first aid. It is recommended that the user become familiar with this information.

For safe pesticide use, it is critical to read the label in its entirety at least four times. The first time to read the label is before the product is purchased, just to make sure that it will fit the need that you have.

The second time to read the label is just before you mix and apply the material. Look especially for any cautions that may be important. If you are going to control Bermudagrass in a marigold bed right next to a Bermudagrass lawn, for example, it is important to shield the lawn area from any drift or accidental misses while drenching the target weeds. Otherwise, damage to the lawn could occur. The label will give this kind of information.

The next time to read a label is before the material is stored. The label will tell you under which conditions that the material can safely be saved for the next use. Most chemicals will break down when stored in extremely high or extremely low temperatures. The last time to read the label is just before disposing of the container. This will help keep hazardous materials out of the landfill.

The pesticide label is a critical tool in helping us to safely select, use and store a pesticide product. By taking just a few extra minutes to read and understand the label, we often can prevent mishaps from occurring.

PLANT POLLINATION CRITICAL

Continued from Page 4

be planted early in the spring to obtain a yield before the hot weather problems of summer can weaken or kill them. Since bees are sluggish in cold weather, late winter storms arriving during the pollination period can slow down the movement of these pollinators through the garden and result in some flowers not receiving pollen. Squash and melons that turn brown at the tips and begin to shrivel up soon after fruit set are common in spring crops and are a direct result of poor pollination.

Another important pollination concept is self-incompatibility. In all sweet cherries and in many varieties of apples, plums and pears, the pollen produced in anthers of one horticultural variety does not function on stigmas of the same variety, even though the stigmas are in flowers of a different tree. This self-incompatibility can significantly reduce or prevent the production of fruit during the growing season. It is for this reason, that pollinator varieties are often recommended for certain plants. For example, the “Anna” apple will produce some fruit without a pollinator, but does much better when it is sharing pollen with another variety like “Golden Dorsett”.

Okay, I know that you are waiting for this next situation: olives. Can we stop pollen shed in olives? My allergies are working overtime and I just can’t face another olive season, you say. The answer is yes, it is possible in olive. There is a product available that will stop pollen shed as long as it is applied at the right time in the flower development. Most people don’t pay that much attention, but prevention of pollen shed in olives is possible. Check your nursery provider or contact us at the Cooperative Extension office for more details.

These are just a few of the problems that are occasionally seen in local gardens and landscapes where pollination is critical to the overall success of the plant. By studying the biology of the plants that we decide to grow, potential problems can either be headed off or at least understood when they occur.

CONTROLLING WEEDS

Continued from Page 3

Another key to selecting the correct herbicide is to be able to tell a monocot plant from a dicot plant, because some herbicides work better on one over the other. Monocot plants, like grasses, have parallel veins in the leaves while dicot plants, those with broad leaves, have netted veins. Compare a 2,4-D label with that of fluazifop. 2,4-D works only on broadleaf or dicot plants while fluazifop only works on grassy monocot weeds. This selectivity means that it is possible to kill broadleaf weeds in a grass lawn with 2, 4-D and bermudagrass weeds in a marigold bed with fluazifop.

Finally, it is important to know how to select the proper herbicide based upon its particular use. For example, a contact herbicide, like cacodylic acid, diquat dibromide or the petroleum distillates, kills when it makes contact with the leaf. If it touches the soil, it is wasted.

Pre-emergent herbicides, like oryzalin and benefin, kill weed seeds as they germinate. That means they have to be applied to the soil. If they touch the leaves of a living plant, they will have no effect on the plant.

In most cases, soil sterilants are to be avoided in garden and landscape situations. These long-lasting, soil-applied chemicals can hang around for months, even years in some cases, and injure or kill the trees and shrubs that we are trying to protect. The most common soil sterilant available is bromacil. If you see that name on the active ingredient list, back off quickly. Resist the urge, even if the price seems right. The cost of replacing trees would make this an extremely expensive decision.

Systemic herbicides are sprayed onto the leaves of plants where they are absorbed into the plant tissue. Because they move with the sap throughout the plant, even distant parts, like the roots, can be killed. Glyphosate and fluazifop are examples of systemic, translocated herbicides.

While all of this may seem a little overwhelming, practice will make the selection of the right weed control method second nature. If you decide to use a herbicide, remember that pesticide labels can be your best friend. When selecting a weed-killing product, read the label carefully and it will tell you all you need to know.

If you have questions, you can reach one of the Master Gardeners at the Cooperative Extension office, 820 E. Cottonwood Lane, Building C, in Casa Grande. The telephone is (520) 836-5221. The author's email address is gibsonrd@ag.arizona.edu.

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