

Integrated Pest Management In A Nutshell

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This article focuses mainly on growing Roses but the principles hold true for any kind of gardening, whether flowers or food.

INTRODUCTION

Integrated Pest Management, commonly referred to as IPM, is a common-sense approach for gardening with a minimum of pesticides, fungicides and herbicides. The benefits of IPM are many:

- A non-toxic environment for people and pets
- Reduced expenditures for toxic chemicals
- Healthier plants
- Healthier soil
- Increased populations of beneficial insects, birds and wildlife by creating a healthy ecosystem.

IPM is not the same as "Organic Gardening" although they share many things in common. Organic gardeners believe in *never* using synthetic chemicals. IPM gardeners believe in using the "*least toxic method*" first, and only using more toxic measures if necessary.

"Necessary" is a subjective decision. You have to determine for yourself what amount of damage to a plant or a crop is acceptable. You have to determine for yourself the levels of synthetic or toxic chemicals you are willing to use and live with. For example, the level of thrips damage to a rose that is acceptable to a pleasure-gardener is probably higher than for a serious exhibitor.

Here are the basics:

WORK WITH WHAT YOU HAVE

Take a look at your growing conditions. Is your yard sunny or shady, dry or wet? Do you get a lot of rain or very little? Lots of wind or is it sheltered? What is your USDA Growing Zone? Is your soil clayey, sandy, or loamy? Does it drain well, too fast or not fast enough? These are all-important considerations for the next part, which is:

SELECT THE RIGHT PLANT FOR THE RIGHT SITE

When you are selecting varieties of Roses it's important to select the ones that have the best chance of thriving under your particular conditions.

Do not plant a shade-loving plant like a Hosta in full sun, or a sun-loving plant like a Rose under shade. If you have a depressed spot that holds the water, then plant a moisture-loving plant there. If you have a dry, sandy, sunny place, then select accordingly from the drought-tolerant species.

You can do a lot to change your microclimate to accommodate different kinds of plants. You can create shade structures, improve your soil and drainage, etc.

Find out from local gardening clubs and your Master Gardeners what particular pests and diseases are common to your area and select accordingly. Choose varieties that have good resistance to those problems. Not all roses are alike. Some are very prone to blackspot, powdery mildew and other diseases, while others are practically "bullet-proof". Don't just pick out something pretty from a catalog or your local nursery until you've actually done a little homework about how well that variety performs in your area. Your local Rose society or the Consulting Rosarian program of the American Rose Society can be great resources for information. Picking the wrong varieties will lead to poor performers, causing you to either think that roses are hard to grow, or that they need constant spraying to survive. Neither is true!

PREPARE YOUR SOIL WELL

Soil tends to be sandy, clayey, or loamy. Sandy soil drains very fast, has little or no organic matter and has few nutrients. Clayey soil is very heavy and drains poorly, tending to suffocate roots. Loamy soil has a good level of organic matter and a mixture of sand and clay. It drains well but retains moisture. For Roses you want a nice, loamy soil. Enter the miracle of COMPOST!

Adding quantities of aged compost will add nutrients and moisture-holding capabilities to sandy soil. Mixing compost into clayey soil will improve drainage. Compost improves any soil. Compost is not as high in N-P-K as synthetic fertilizers, but compost has something they don't have. Compost fosters the growth of beneficial microorganisms in your soil, and these microorganisms increase the health and disease-resistance of your plants! Soil is not just something to hold the roots, soil is a living thing. Synthetic fertilizers feed the plant, but compost feeds the soil. A soil rich in organic matter provides a home for earthworms and earthworm castings are one of the best fertilizers for roses!

Before starting in with amendments, I recommend you get a soil analysis from your county extension service. They will tell you what kind of soil you have to begin with, and what Macro and Micronutrients may be deficient. A soil analysis will save you a lot of money in the long run as you can spend a lot of money throwing down soil amendments that you may not need, and miss the ones you do need. This can really effect the health of your plants.

I have seen the importance of organic amendments for soil health. I use a lot of organic compost on my roses and seldom see any blackspot or mildew. What little I get is easy to ignore. In a local rose garden

here in town where the roses are fed a diet of synthetic fertilizer, the blackspot was non-existent the first year but has gotten worse and worse each successive year. I suspect that the soil is not being fed as it needs to be and the roses don't have much resistance anymore.

INTERPLANT TO CREATE BIODIVERSITY

Avoid making your garden a monoculture. If you grow nothing but roses planted closely together, pests and diseases will think you laid a table out just for their benefit. If you interplant with herbs, annuals and other perennials you "break up the menu". This will attract many beneficial insects and birds (not to mention toads) and confuse the pests.

You can interplant with alliums such as various chives, garlic and ornamental onions. Many pests hate the alliums and the sulfur created in the soil will give added resistance to blackspot and mildew.

Roses look beautiful with daylilies, lavender, basil, petunias, and many other plants. A caution about marigolds, though: Marigolds are host plants to spidermites. Do not plant marigolds near your roses.

MAKE A PROPER IDENTIFICATION OF THE PEST OR DISEASE

Sooner or later, in spite of everything, you will eventually encounter pests or diseases with your roses. It's important to make a proper ID of the problem before trying to treat it.

For example, when the leaves on your Rose turn yellow it can be from a myriad of reasons:

Are the older leaves more affected, or the younger ones?

Old leaves naturally yellow and fall off when winter approaches or under heat stress in the hotter climates. If you are getting this "summer dormancy", don't panic; just keep watering and wait for the cooler temperatures of fall.

If the new leaves turn pale yellow it could mean a Nitrogen deficiency. When the veins are green but the areas between the veins are yellow it could mean iron or magnesium deficiency, or overwatering/poor drainage. Soil that is too wet reduces the amount of oxygen available to the plant and can cause yellowing and leaf drop.

Are the leaves on the bottom mostly affected, turning stippled, bronzy and very dry? That could mean Spidermites. Spidermites come when conditions are hot and dry.

So you see, you need to identify the problem before reaching for a solution.

ALWAYS TRY THE LEAST-TOXIC METHOD FIRST

Once you have identified the pest or disease, you need to decide what to do. There is usually more than one solution and they can vary greatly in effectiveness, cost and toxicity. Some problems are merely cosmetic but pose no lasting harm to the plant, while others can be deadly.

"Least-toxic" methods include beneficial insects, spraying with water, anti-transpirants, and low-toxicity insecticidal soaps and fungicides such as Sulfur and Copper. More toxic are the common commercial fungicides. Worst of all and never to be used are the systemic insecticide granules that you water into the soil. They are often sold as All-In-One combination fertilizer/insecticides. More about this garbage later!

There are occasions when only a strong poison will work. If you have a valuable tree with a severe infestation of difficult-to-kill borers, and it's a matter of killing the borers or losing the tree and having the problem spread to other trees, then by all means use the proper pesticide.

But if it's a matter of long-term garden management, try to find plants that do not require frequent, repetitive spraying of toxic chemicals in order to decorate your yard. Or try to accept a little damage as the price for a safe environment. *Realize that perfection is not an attainable goal when it comes to gardens.*

HERE ARE SOME TIPS FOR COMMON DISEASES AND PESTS:

Powdery Mildew can be ugly, leaving a white, fuzzy coating on leaves, stems and buds. Overall though, it isn't that harmful. PM happens when days are hot and nights are cool and the soil is too dry. If you live in a dry climate you can actually wash the mildew spores off the leaves with a strong blast of water in the mornings. Be sure to wash off the leaves when the sun can dry them relatively quickly. Washing the leaves several times a week can reduce powdery mildew, aphids and spidermites and the roses seem to be happy after their bath.

If that doesn't work or for some reason you don't want to wash the leaves off, you can try an **Anti-transpirant**. Anti-transpirants create a thin barrier on the leaves that prevents fungal spores from settling in. **Anti-transpirants** are helpful for preventing **Mildew, Blackspot** and **Rust**. Liquid kelp, mixtures of kelp and fish emulsion, compost tea or manure tea all work as anti-transpirants. As an added benefit they also give your roses and other plants a real boost during times of drought, wind and heat stress.

If you still have mildew and it's worse than you are willing to live with, you can try a copper-soap type of fungicide. This is something you will have to use caution with, but it won't leave as toxic a residue as the conventional fungicides (see my related article on "Safe Spraying Practices").

With pests and diseases it is important to learn about the life cycles and growing conditions that foster the problem. That way you can spray at the most effective times to do the most damage with the least amount of material.

Aphids are really easy to deal with. Just knock them down with a sharp blast of water. Do this three days in a row and they're gone! They tend to come when there is a lot of tender new growth. Later in the season they diminish anyway. Try not to overfeed Nitrogen.

Aphids are mostly female and are born pregnant for five generations! If you spray with soap or poison you will kill the current generation, but maybe not the eggs, so you will need to repeat spraying. As long as you're going to need to repeat spraying, why not repeat with water instead of something more toxic?

Ladybugs, Green Lacewings and tiny Trichogramma Wasps all destroy aphids, spidermites and thrips to some extent. Birds eat aphids. A friend of mine swears that allowing tall grasses or spiky flowers to grow near her roses gives the ladybugs something to climb, so they can hop over to the roses and eat the aphids!

With Ladybugs, it's the larvae that eat the most aphids. The larvae look really scary. They are little gray-brown lumpy creatures with red or orange spots on their backs. They look a bit like alligators. If you see them crawling around on your plants, don't kill them!

Spidermites are a much more severe problem than aphids. Arriving in hot, dry weather, spidermites can kill a miniature rose in a few days. With spidermites, you need to take action fast. You will see the leaves will turn yellow, then bronze, and become dry and crumbly. The undersides of the leaves may look "dirty". If you look with a magnifying glass you will see the little buggers on the underside of the leaves. If you tap the leaf over a white sheet of paper you may see them moving around. If you see webbing on the plant that means the problem is advanced.

The solution is simple: Spidermites hate moisture and have a five-day reproductive cycle in hot weather. Blast the undersides of the leaves with a strong spray of water every morning for five days in a row. This will kill the adults and successive hatching, killing the new generations before they can reproduce.

If you cannot do this and need to spray, know that insecticides will not kill spidermites. For spidermites you need a miticide, not an insecticide. Read the label carefully before buying a product and make sure that it's labeled effective for the pest you need to treat.

Thrips are very tiny creatures that damage the buds and flowers. They cause cosmetic damage but no danger. They usually disappear after the first flush of blooms. You may be able to treat them with predatory insects or Diatomaceous Earth. Thrips lay their eggs in the soil and when they hatch they migrate up the canes into the buds. When you see thrips damage on an open flower it is too late to treat for them. You need to treat them when the sepals begin to part and show strips of color. Once the thrips are inside the buds you cannot reach them. Treat the buds and the ground at the same time. I have heard that blue or white sticky traps are useful for flying thrips.

If you need to spray for thrips, use Orthene. Spray only the buds as they begin to show color, and the ground. There is no need to spray the whole plant. Repeat the spray exactly five days later and that should do it.

LEARN ABOUT SPRAYS AND ALWAYS READ THE LABEL

If you've selected good varieties, improved your soil, created the best conditions you can, tried the least toxic methods first and still have more damage than you can live with, then you probably will want create a different kind of garden or else spray.

When you shop for a spray, read the label carefully. Is it labeled specifically for the insect or disease you are trying to treat? If you have an insect problem do not buy a fungicide; if you have a fungal problem do not buy an insecticide. If you have spidermites you will need a miticide, not an insecticide.

Read the label carefully and follow all instructions to the letter. Do not buy more than you can use in a reasonable amount of time- it often loses potency when stored for years. Do not think that because a little is good, more will be better. You will only kill your plants that way, and maybe make yourself sick, too. Always water your garden well before spraying or applying strong fertilizer.

The rule of thumb is to spray for fungal disease preventatively and on a schedule (this holds true for water and other non-toxic spraying, too), and spray for insect pests only on an "as needed" basis. Spraying for pests when not needed will destroy your beneficial insects and create conditions that actually *encourage* pest problems. Many people have experienced what happens when they spread a broad-based insecticide like Sevin dust for general insect control, only to be inundated with a plague of spidermites two weeks later. What happened was they killed off the predatory insects that kept the spidermites in check. For this reason I discourage the use of "combination" sprays or fertilizers that promise to do away with pests while fertilizing or treating diseases.

The "**systemic**" **fertilizer/insecticides** are the worst of all. They use the most toxic poisons ever developed, they poison your soil and your plants, and THEY DON'T WORK! Most pests such as aphids like tender new growth. Once the systemic is absorbed, any new growth that comes later will not be affected and the aphids will suck away like always. In the dry desert southwest we don't get enough rainfall and this stuff can kill the plants entirely.

The poison is applied in granular form to the soil and watered in. The fertilizer is synthetic and does nothing to feed your soil, while the poison gets absorbed into the plant tissue, making the plant toxic. If you have a pet that likes to nibble on leaves, they can die from eating just a little of this stuff! If you also feed fish emulsion, bone meal, blood meal, or other "tasty" stuff that attracts pets and they eat some of the treated soil, they can die! Systemic insecticide will kill earthworms.

The runoff from systemic insecticides is very toxic, especially if it gets into your or your neighbor's vegetable garden. In my opinion, using systemic insecticides is equivalent to leaving pans of anti-freeze out to poison pets! ***There is no problem that can only be treated with a systemic insecticide, and that cannot be treated better with safer methods.***

This is only an overview of IPM. You can find books and websites that will give you a lot more detail and specific solutions. I have several of these sites linked on my homepage and I encourage you to check them out.

I wish you a beautiful, healthy garden!