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Mosquitoes are familiar and annoying pests of both humans as well as animals. Their rapid wing movement produces that all too familiar high-pitched humming sound and their bites cause red itchy welts. I remember way back in my old Boy Scouting days, we used to go to summer camp about the hottest time of the year and the battles with mosquitoes at Camp Jackson became legendary. One summer in particular, I came home from camp and darn near had to have a blood transfusion.

Mosquitoes are more than a simple nuisance; however, because they can at times serve as vectors for some pretty nasty diseases such as Eastern Equine Encephalomyelitis (the name alone strikes fear in my heart because I'm afraid that some day I may have to pronounce it in public). Most people think we have only one insect that we call "mosquitoes". Alabama, however, has more than 50 entirely different species of mosquitoes.

Initially mosquitoes use odor and chemical cues to locate their food source. Moist carbon dioxide rich air exhaled by animals including humans act as a locator beacon for the mosquitoes. Only the adult females bite and feed on blood, and not even all species of adult female mosquitoes bite. I think some of the most interesting mosquito species are actually cannibalistic. The larvae of these mosquitoes feed on the larvae of other mosquito species. As adults, they feed entirely on the nectar and other juices produced by plants. They are easily recognized because they are very large and conspicuous, often times buzzing a light fixture in the house or at an outside porch light. These cannibalistic mosquitoes do not bite humans.

The best means of protecting yourself from the biting species of mosquitoes is to schedule outdoor activities before or after peak mosquito activity, usually late afternoon and around dusk. Repellants containing diethyl toluamide, commonly called "DEET", are effective in discouraging mosquitoes from biting. You need not drench yourself in insect repellent, use only enough to confuse the insects so they cannot find a suitable spot to stop and feed. I have seen repellents with as much as 95% DEET content; however, these are much too concentrated and can even cause skin irritation. Look for concentrations of no more than 30-35 percent DEET for adults and around 8 percent for children. They will be less costly, less likely to cause

irritation, and just as effective. Some DEET-free repellents containing citronella are also fairly effective.

It is also advisable to wear long sleeved shirts and long pants when outdoors during peak mosquito hours. The less exposed skin will mean less mosquito bites. Also dark colored clothing tends to attract mosquitos more than light colored clothing.

Once bitten, ointments that contain hydrocortisone, benzyl benzoate, or calamine can provide relief from the seemingly nonstop itching. The saliva that is injected into the bite wound causes the itch from mosquito bites. The saliva contains a protein that serves as an anticoagulant and helps the mosquito feed. Our own body reacts to the protein in the saliva and produces the itch.

Controlling mosquitoes is a complex issue, one that most homeowners cannot undertake themselves. Remember that it is absolutely impossible to spray all the potential mosquito habitats in an entire city, county, or even backyard for that matter to get total control of mosquitoes. There are a few things homeowners can do to help reduce the number of mosquitoes in and around your backyard.

The first step is to eliminate breeding sites, that includes any and all places where water can stand. Drainage ditches, water puddles including those around air conditioner outlets, even old tires and other debris are prime mosquito breeding sites. Adult mosquitoes rest on dense vegetation during the day. Cut tall weeds and grass and keep shrubs and trees pruned away from the house to increase air circulation. Clean debris from rain gutters and eliminate standing water around or on flat roofs, leaky pipes and hydrants, and low lying areas. Change the water in birdbaths and wading pools weekly and pet watering bowls daily. For those of you who enjoy backyard ornamental ponds (remember mosquitoes are not picky about the water they choose to lay eggs in) try stocking the pond with gambusia fish or “mosquito eating” fish. Also remember that certain other animals including dragon fly larvae that also eat mosquito larvae and bats are absolutely deadly to mosquitoes eating as many as 2,000 mosquitoes per bat every night.

Physical barriers can prevent mosquitoes from gaining entrance into your house. Install mesh screens that are at least 16 to 18 mesh. Caulk around cracks and crevices, windowsills, and other entrance points to your home. You may also choose to screen the chimney and other vent flues during mosquito season, but be sure to remove the screen if you use the chimney or vents during the winter.

Finally, there are the chemical controls that most homeowners ask me about. These products are either larvicides (those that kill immature insects)

or adulticides (those that kill adult insects). *Bacillus thuringiensis* var. *israelensis* (B.t.i) that is commercially available and commonly sold as mosquito briquettes or “doughnuts” as they are commonly called can be safely used in water that cannot drain to control mosquito larvae. Unused swimming pools, retention ponds, and permanent puddles are examples. There are even products made specifically for use in backyard ornamental pools. B.t.i. is considered a biological method of control and poses little if any threat to nontarget organisms or people. It comes as a liquid that breaks down very rapidly when exposed to direct sunlight or as slowly dissolving briquettes that can last up to 30 days. Insect growth regulators such as methoprene can be used in water when fish are present. Methoprene acts by preventing larvae from becoming adults. Malathion and a host of pyrethrins are also used as larvicides. Read the label carefully, especially with regards to fish and other nontarget organisms, if you choose these products. Not all products will work in every situation.

Adulticides include yard foggers that usually contain pyrethrins. They can be set off shortly before outdoor activities and will provide temporary (very temporary) relief from mosquitoes. You can also treat shrubs and lower tree branches of trees where mosquitoes rest with any insecticide labeled for use on flying insects including malathion, permethrin, and any of several pyrethroids. Just remember that spraying adult mosquitoes is more or less like trying to put out a forest fire with a garden hose.

One final strategy that I will mention... one that I think is uniquely Southern. What else could I be referring to but the old electric bug zapper! Some one with obviously too much time on their hands researched this device and actually found out that less than five percent (that’s one out of twenty) bugs killed in the zapper was a female biting mosquito. Some models actually attracted more insects into an area than would ordinarily be there. Don’t count on them for mosquito control, but if you are one of those “traditional Southerners” like myself who enjoys good entertainment, go ahead and purchase one. Since I already have a bug zapper for entertainment, this year I added a lounge chair so that I wouldn’t have to stand up to watch my bug zapper. Maybe next year they will have a zapper that comes with a remote control.

There is no single answer to the mosquito problem. Chemical controls don’t seem to be effective without breeding habitat elimination and vice versa. Trying to eliminate all the mosquitoes in your area with the tools we have to do it is not a realistic strategy for homeowners. With a little patience, though, and a good plan of action you can at least make your backyard area more tolerable during outdoor summer activities.