

Summer Mosquitoes

📅 Thu, 6/10 12:30PM ⌚ 23:33

SUMMARY KEYWORDS

mosquitoes, repellent, water, lewis, sprays, people, backyard, biting, fog, west nile virus, iowa state university, rain, eggs, small farms, talk, species, attracts, standing, impoundment, mosquito population

SPEAKERS

Christa Hartsook, Dr. Donald Lewis

-
- C** Christa Hartsook 00:15
Hello, and welcome to the small farms podcast, a production of the Small Farms program at Iowa State University Extension and Outreach. Our podcast covers the opportunities and challenges associated with rural life. In this episode I visit with Dr. Donald Lewis, professor and extension entomologist for Iowa State University. Today we're talking about mosquitoes. I'm Christa Hartsook, Small Farms Program Coordinator, and we hope you enjoy the show. Dr. Lewis, welcome to the show.
 - D** Dr. Donald Lewis 00:45
Glad to be here.
 - C** Christa Hartsook 00:47
So today we're talking about everybody's favorite backyard visitor mosquitoes. And I wanted to start out in asking you are there different types and varieties?
 - D** Dr. Donald Lewis 00:56
Mosquitoes are well known, you usually don't have to describe a mosquito to an Iowan. When you say the word or you abbreviate it as Skeeter, they know what you mean. They

know those blood sucking insects that buzz in your ear and bite and cause itchy welts. We have about 50 different species of mosquitoes in Iowa. Some of them love people. Some of them prefer other animals, but will bite people. And then we have some that would rather stay and feed on birds or other animals and not bother us at all. But of the 50, we have some that are capable of producing really large numbers in a fairly short amount of time. And it's really just a handful of species that cause most of our problems.



Christa Hartsook 01:48

Okay, so what are some of those that are more prevalent in Iowa than Dr. Lewis,



Dr. Donald Lewis 01:54

There are several mosquitoes that are collectively referred to as 'Flood Water Mosquitoes.' Floodwater Mosquitoes are the ones that come a week to 10 days after we've had a heavy rain. Not too heavy rain, not a light rain, but a good soaking rain that created water impoundments that stayed flooded long enough for these mosquitoes to develop. Now, the other reason they're called Floodwater Mosquitoes is the females will lay their eggs on vegetation or on other items that are next to the water, not in the water, but next to it. So when the flood comes when the water level rises, those mosquito eggs are now underwater, and they hatch. And that water impoundment can be a pond, it can be the roadside ditch, it can be anything as small as the cavity that's in a tree. So all of those places that can hold water for at least a week to 10 days can develop these mosquitoes, we call the Floodwater Mosquitoes, and those are the ones we see specifically early in the season. Later on, we'll have mosquitoes that also need some standing water for breeding, but they develop slightly differently and that the females lay their eggs directly into the water. So those are the ones that we usually combat the most.



Christa Hartsook 03:17

Okay, so I'm hearing then that water is a very important part of their lifecycle.



Dr. Donald Lewis 03:22

Standing water is essential for the development of mosquitoes. Running water tends to not produce mosquitoes because they would float with the current and they would be gone. It's the stagnant, standing water. Under really warm conditions, we might get mosquitoes to develop from the eggs that are laid or the eggs that were submerged to the adult stage in maybe five days, but more likely a week to 10 days, sometimes up to two weeks. If it gets cool, that will be even longer. But the mosquito has to be in standing

water for that entire period of time while it's developing. So let's back up and remind ourselves that mosquitoes like beetles, butterflies, moths, ants, all the other flies have a complete lifecycle of four stages, egg larva, pupa, and adult. The eggs we talked about either being laid in water or next to water, the larvae then hatch from those eggs and begin wiggling in the water as they feed on the organic matter that's in the water. So there's another requirement, but water has to stand there for a long period of time. The water has to have algae and other debris in it for the mosquito larvae to feed on, and then they will be in that stage for again one week, 10 days, two weeks before they go into a pupa. The pupa is also in the water and will tumble as it rolls around in the water and then it eventually will come to the surface and adult mosquito will come out of that pupa. So egg, larva, pupa, and adult — only the adult is out of the water. The other three stages can only develop in stagnant, standing water.



Christa Hartsook 05:16

Okay, so Dr. Lewis then does our population vary based on that amount of stagnant water available year to year? What we're seeing in terms of rainfall?



Dr. Donald Lewis 05:27

Exactly. And temperature is also a factor there. But to get standing water for that period of time, the rains have to be substantial, and well spaced. Now, when we get a lot of rain early in the season, and it's still cool, we don't get mosquitoes because number one, it's still too cool for them to develop. But also, when you get lots and lots of rain over and over again, those impoundments and for purposes of illustration, just picture the birdbath in your backyard. If it gets lots of water, and it keeps flowing out any mosquitoes that were in there are flushed out. So we need the rains to be heavy, but spaced apart. And so when that space occurs between the rainfalls and that water stays there, remains in that impoundment, the mosquitoes have the opportunity to breathe. Now if we go into a drought, that impoundment dries up, think of the depression the mud puddle alongside the road in the in the drainage ditch. When that dries up, the mosquitoes stop developing. So it takes a pretty specific set of circumstances to create a mosquito population explosion. It has to be warm, have to have a lot of rain, but the rains have to be well spaced.



Christa Hartsook 06:47

Okay, Dr. Lewis, random question here. But are mosquitoes attracted more to some people than to other people?

D

Dr. Donald Lewis 06:55

Yes, I can document that in my own family that I'm not the preferred host for mosquitoes that are biting in the evening, or when we're trying to walk through the park or have a picnic. Some people do seem to attract more mosquitoes than others. Sometimes we refer to these people as biological magnets because they're attracting biting pests, whether it be mosquitoes, ticks, or fleas, they're just some people that seem to have more. Your follow up question is probably going to be 'Why are some people more attractive than others?' And I don't have a good answer. It's all dependent on body chemistry. How much carbon dioxide are you expelling that attracts mosquitoes to you? How warm is your skin surface as part of the message that mosquitoes are perceiving? And finally, what are the volatile organic chemicals that are coming from your body that the mosquitos are using as cues to find you out of all the big wide world, they have to have those cues to figure out that you are a potential host the closer they get other cues take over and say you're going to be a good host. So there's a huge amount of variables that are part of our body chemistry that makes some people biological magnets and the rest of us less so.

C

Christa Hartsook 08:15

Okay, so then Dr. Lewis, we get into a little bit more of control measures, right? Because we do want to be able to enjoy our backyard and our outdoor spaces. What are some of those practical control measures for homeowners?

D

Dr. Donald Lewis 08:29

Number one, realize nothing is going to be perfect. Nothing is going to work to immediately eliminate all mosquitoes, nothing is going to work that will keep them gone for a long period of time. We have lots of little steps we can take and together they may change the dynamic slightly, but just know going in that there is no perfect answer. There is no silver bullet. There is no one and done that's going to get rid of mosquitoes around you forever. So let's start with that breeding site. Mosquitoes have to have temporary water impoundments. I mentioned the bird bath, I've mentioned puddles. It could be buckets, cans, toys, anything in the yard that holds water for that extended period of time. What do you have on your property that fits that description? And what can you do about it to make sure the water doesn't stay there. Lots of things like buckets should be turned over or eliminated, or cans should be picked up and discarded. Plugged downspouts which you know because all the rain is running off the top of your house and splashing into your flowerbed. A plug downspout is holding water for a prolonged period of time. Do you have a screen on the top of your rain barrel? These are all standing water places where mosquitoes could be breeding, they could be reproducing and can you take care of them? Now if you have a water feature like a fountain, that water is probably moving it

might be circulating, it may not be breeding mosquitoes. But if you turned it off that certainly could, if you have a water feature like a pond in your backyard, you could breed mosquitoes there, unless you're taking extra steps to make sure they're not. Perhaps you have fish in that pond. So number one is think about all these impoundments. Some of them are quick and easy to fix. Others, like the low spot at the back of your property that holds water like a swamp won't be so easy to drain. But is there something we could do to fill that? Is there something we could do to tile that could we create an outlet for that water? What can you do to keep water from standing on your property. So not raising mosquitoes is the first step. Having said that, if you did that perfectly, you would probably still have mosquitoes, because mosquitoes can travel for miles from where they develop and standing water. Think about how small they are. Think about them getting up in the air getting caught in a breeze, they can fly in and blow in the wind for a long, long distance and end up in your yard. So you inherit mosquitoes from other properties, not just the ones you raise yourself.

C

Christa Hartsook 11:16

Dr. Lewis, if we talk then about different sprays or repellents that you know you could put on your yard, you could put on your own person, are there some that are more effective than others?

D

Dr. Donald Lewis 11:29

All sprays and fogs that we apply to the environment are likely to have some benefit. But I think it's going to be a small benefit. And it's going to be very temporary. In the city of Ames here. Our parks are fogged once a week. Our golf courses are fogged once a week. Because there is nothing that's going to last long enough for a season long control. So whatever you're going to do is going to have to be repeated frequently. And there are sprays and fogs available. Some of these are just the plain garden and landscape insecticides that you might already have for treating your turf grass, or for spraying your trees and shrubs. But what we do with those sprays is apply it to the sites where the mosquitoes are resting during the day. And that's tall grass, shrub borders, flower beds, flower borders, tall vegetation, where the mosquitoes just stopped during the daytime, they cling there and they rest waiting for the sun to go down waiting for dusk, when most of the species will come out and resume biting. So an insecticide spray to those areas will reduce the population, it's not likely going to eliminate the population. And again, it's going to be a very temporary control. You can buy foggers at the hardware store or the garden center. These may be electric powered or propane powered. What it does is it takes an insecticide liquid and breaks it into real tiny little droplets that sort of fog the air and they float through the air, they land in those same resting sites we just described the

tall grasses, the flower beds and so forth, you can fog those areas. Now if you use a fogger, you buy the concentrate that the manufacturer recommends, you use it according to label directions, and it's going to be a little extra labor and a little extra problem. As a routine control, I would not recommend using mosquito sprays in the backyard, around the farm, up near the buildings as your main method of control. It's very temporary. It's going to be something you have to repeat often. But if you've got a birthday party coming up, if you've got an occasion where you're wanting to be out in the backyard with a group of people that temporary benefit from a fog the day before or the night before, may be all you need and would be useful to you in that regard. It's not going to give you season long control, but it may be long enough to enjoy your party outdoors.

C

Christa Hartsook 14:11

Perfect. Dr. Lewis, when we do talk about outdoors then you know on our small farms in our acreages, we have pets and livestock animals. Is there a point when we need to worry about mosquitoes and our pets or our livestock?

D

Dr. Donald Lewis 14:28

Livestock get off fairly easily. One exception would be the equine encephalitis in horses and that's a virus that that can be quite damaging. That also transmits over into people. So the encephalitis is something you should talk to your veterinarian about. As a pet owner myself, the one that I worried most about was heartworm in my dog, and if your dog is outside and where mosquitoes may bite them, they can transmit the small microscopic worms that lodge in the dog's circulatory system in the heart and reduce stamina, reduce health, reduce vigor. So heartworm and equine encephalitis are probably the ones we worry about outside for other animals. Of course, as an animal outside ourselves, the one we probably most worried about is West Nile virus, which is a virus transmitted by mosquitoes at the end of the summer. It's a species of mosquito that is more prominent in the second half of the summer, which is why we see West Nile virus cases build up by midsummer, and then reach their peak at the end of the summer. So mosquitoes are referred to as the deadliest animal for a good reason. Fortunately, up here in the upper Midwest, that's not our problem. But when you think on a worldwide scale, with Malaria, Yellow Fever, other diseases that are transmitted by mosquitoes, they are the biggest killer on the planet.

C

Christa Hartsook 16:04

Dr. Lewis, are there things that we need to think about or kind of give ourselves preparation for in terms of potential West Nile exposure, you know, towards the end of the

summer, end of the season,

D

Dr. Donald Lewis 16:15

We talked about control by not breeding mosquitoes, maybe occasionally using an insecticide, spray, or fog to kill the ones that are there. We also could treat standing water when I talked about eliminating standing water, there are times you just can't get rid of it. And there are insecticides that can be applied to standing water to kill the larvae before they turn into the adult stage. So those are how we prevent mosquitoes once they're already here. The fogs will take care of some of them, but not all of them. So it comes back to us to use personal protection. And that means using repellents and the skin applied repellents are really our best defense against mosquito bites. There's a long list of products available. They all work for varying amounts of time. It turns out most repellents on the market, especially the synthetic products, the ones that are sold in the stores will work. The question is for how long. And when testing is done, we find some repellents may work for 15 minutes or less. So if you're only going to run out, harvest some homegrown tomatoes and run back in that type of repellent might be satisfactory. But if you're going to be outside gardening for a long period of time, if you're going to be out working around the landscape or around the farm, if you're going to be out for a long period of time, you probably don't want to be reapplying that often. So we go with other repellents that have a longer residual. So repellents will work, you just have to apply the one that works best for you. We always suggest a low concentration repellent, you don't need a repellent that's more than 25 or 30% active ingredient. And then you just follow directions as far as reapplying it as necessary. Repellents should be washed off when you come back inside. So you've applied the repellent to expose skin, you put some on the palms of your hands to do your ears and the sides of your face and maybe your forehead. And then when you come in, make sure you wash those areas when the repellent is no longer needed. So we've got all these things we can do. What it really comes down to is using those repellents when we have to be outside. Now for that birthday party I mentioned where you're going to have guests in your backyard. I've always thought one of the classy things you could do would be as the guests arrive, you have a little table and on the table is a basket with repellent towelettes. These are little foil packages that you rip open and you take out a little towelette that that's saturated with the repellent and you carefully rub that on your exposed skin. Of course there's a wastebasket there for people to drop them in. So you can get repellent sprays you can get lapel and lotions, those repellent towelettes might be an interesting way to provide repellent to guests that are coming to your property.

C

Christa Hartsook 19:13

That sounds great. What a great idea. Dr. Lewis, I'm wondering if you can talk to us a little

bit about the ISU Mosquito Surveillance Program and website that is out there.

D

Dr. Donald Lewis 19:23

Iowa State University Department of Entomology Mosquito Lab has been doing mosquito surveillance around the state since the 1960s. This is in partnership with the Iowa Department of Health and with county departments of health that traps are put up in these various counties that cooperate to catch mosquitoes overnight. These are traps that are baited with either dry ice or a synthetic material that attracts mosquitoes that are sucked into a little net. They're sucked in fairly gently because that net full of dead mosquitoes is then sent to Iowa State University, where a lab full of students sort them out and count them by species. And there may be 1000s and 1000s of mosquitoes in one sample. And yet they're divided up and they're tested. Now, at the same time, the mosquito surveillance program is testing blood from chickens that are housed in these various counties around the state. And the blood is tested for the presence of the West Nile virus. So what we're doing is we're counting mosquitoes, we're checking for virus in chicken blood as a way to look forward to say what's going to happen? What is our risk this year. And we know from just recent experience that West Nile virus just jumps all over the place from year to year. Last year, in 2019, there are only five cases of West Nile virus in the state of Iowa. The year before in 2018, there were 104 cases. The year before that in 2017, there were only 12. So the number of West Nile virus cases is highly variable. And this surveillance program is primarily aimed at trying to look ahead and see what's likely to happen with West Nile virus. It's an interesting website, if you go to Iowa State University, the website is iastate.edu and you go to the index and look under 'm' for mosquito, you'll find that surveillance data and you'll see how the mosquito population is around the state. Now, that may not be the same as the mosquito population in your backyard, because this is an average of several counties that are catching and categorizing the mosquitoes. But it's a great historical record of the species of mosquitoes that we have in their prevalence throughout the year.

C

Christa Hartsook 21:55

Dr. Lewis, I know this is not anybody's favorite insect by any stretch of the imagination. But is there anything else we need to talk about or be aware of in terms of mosquitoes for our coming rest of our summer?

D

Dr. Donald Lewis 22:07

People often ask, Why? Why are there insects? Why are there flies? Why are there mosquitoes? And we always take the anthropocentric view of life that what's in it for us.

What about me? Why are there mosquitoes biting me? Well, mosquitoes have a larger role in the ecosystem than just biting people. Those mosquitoes that are developing and standing water are great food for aquatic organisms. Some of our smaller aquatic organisms eat the mosquito larvae. Those organisms that are eaten by fish, the whole food chain may start with mosquito larvae in water. They're also great food for bats and a few birds. So mosquitoes are parts of food webs in our ecosystems. They're not a part that we particularly enjoy, but they're out there and our job is to find a way to live with them because we're not going to live without them.



Christa Hartsook 23:08

That's a very good point. Dr. Lewis, thanks so much for being on today. We appreciate it.



Dr. Donald Lewis 23:14

Glad to be here. Thank you for the opportunity.



23:16

This program is brought to you by Iowa State University Extension and Outreach. This institution is an equal opportunity provider for the full non-discrimination statement or accommodation inquires go to www.extension.iastate.edu/diversity/ext.