TIMELY TOPICS

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Home Grown – Grasshopper Control

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It was hard to decide on a topic for this week's Home Grown because I have been getting calls and questions about so many topics. I decided to settle on grasshoppers because in a matter of hours I had four questions on these creatures, and they are being destructive. I suggested the grasshoppers become an additional income by catching them and selling them to restaurants, or to be used as fish bait, that didn't go over to well. So, I found this great publication by Tom Royer and Eric Rebek to share.

Oklahoma, with its forest and grassland landscapes is blessed (or cursed) with more than 130 resident species of grasshoppers. Fortunately, only 4 or 5 of them ever become pest problems. The redlegged, migratory, differential, and two-striped grasshoppers are major pest species, with the differential and two-striped being the main culprits causing damage to ornamental and vegetable plants. Grasshoppers are more of a problem in rural communities, especially if they are surrounded by pastures or rangeland, or urban fringe areas that contain large amounts of ground overgrown with weeds and vegetation. Grasshoppers are difficult to control in the urban landscape, but homeowners can reduce their impact through the use of barriers and insecticides, and by selecting plants less prone to damage.

Biology: Regarding grasshopper biology; one size does NOT fit all, but they all possess some similarities. All grasshoppers undergo gradual metamorphosis and have three life stages: the egg, nymph, and adult. Grasshopper eggs are laid in pods containing from 8-30 eggs and deposited in the soil. Grasshoppers lay eggs during the fall in non-crop landscapes such as ditches, fencerows, shelter-belts, and weedy disturbed areas, or sometimes in harvested crop fields and pastures. The eggs hatch the following spring (April-June). Nymphs grow through 5 instars before becoming adults, shedding their cuticle each time. It usually takes the nymphs from 35-50 days to become adults. Most grasshoppers overwinter as eggs and produce only one generation each year, but differences in spring temperatures and successive emergence of different species make it seem like there is an endless "hatch" throughout the spring and summer.

Damage: Grasshoppers eat plants, but most specialize on grasses or broadleaf plants. Pest species, on the other hand, feed on a wide variety of plants and will readily switch from grasses to broadleaves. As nymphs, grasshoppers tend to congregate and remain near their hatching areas. They will remain there as long as there is an adequate supply of food and shelter. When food runs out they will move. Immature grasshoppers can't move very far, because they don't have wings, but winged adults can fly for miles in search of new food sources. Hungry grasshoppers like gardens because they have optimal moisture and excellent plant growing conditions that provide an abundant food supply.

Grasshopper Management: People become alarmed when grasshoppers suddenly appear and begin feeding on prized flowers, vegetables, and ornamental plants. The distress can turn to frustration when grasshoppers are still seen after plants have been sprayed. In most situations, the spray worked and killed the grasshoppers that were there, but there is simply more grasshoppers moving in to take their place. The insecticides available for grasshopper control have a limited residual activity and will not kill new arrivals after several days. Grasshopper management in the garden and landscape requires patience, and when possible, cooperation with your neighbors.

Find hatching sites in surrounding areas and spot treat them with registered insecticides. Either flag those areas and treat them, or, in more suburban areas, try and work with your neighbors to find the sites and develop a neighborhood-wide control program. Best control is achieved if applied to immature grasshoppers in the 2nd and 3rd instar (less than 1/2 inch long).

Purchase floating row covers to protect vegetables and prized plants. These fabrics permit sunlight to get through and allow for air circulation yet are strong enough to keep grasshoppers from feeding. They can be sprayed with an appropriate insecticide to enhance their effectiveness. If the plants being protected require pollination (such as cucurbits), they may have to be hand-pollinated. Floating row covers are available at garden and nursery supply stores.

Poultry, especially guinea hens, are effective predators. They may be useful for gardeners who live in rural areas and have room and interest in keeping them.

Control with Insecticides: Several insecticides are registered and effective at killing grasshoppers. Insecticides work better on small grasshoppers because it takes less active ingredient to kill them. If a single rate is applied (as is suggested in many labels) it will work better and kill grasshoppers longer if they are small.

Temperature and sunlight: Insecticides start to break down as soon as they are mixed with water. They also break down when exposed to sunlight, and the breakdown process speeds up as temperatures increase. Thus, in the summer when temperatures are high and sunlight intense, most insecticides will work for about 24 hours. As summer progresses, grasshoppers get bigger, move faster and feed more intensely. All of this means that sprays will need to be repeated to keep plants protected with an insecticide late in the growing season.

Border treatments: Home yards and gardens in rural areas that are surrounded by range or pastures are subject to invasion by grasshoppers from those areas. Irrigated yards and gardens are an “oasis” for grasshoppers during the heat of the dry summer months. The best way to control grasshoppers in this situation is to prevent them from ever entering the yard. That can best be accomplished by treating the surrounding range and pasture lands to control the grasshoppers as described in EPP-7196, Grasshopper Management in Rangeland, Pastures, and Crops. If preventative control is not possible, the best alternative is to make a border treatment around the yard and garden. Generally, grasshoppers move across areas in ‘jumps’ as they search for suitable food. A homeowner can slow or block their movement by treating all vegetation in a band or border perimeter around the yard and/or garden with an insecticide. Border treatments that are wider provide more effective control.

Yard and garden treatments: The line of last defense is to directly spray the plants that need to be protected. However, none of the insecticides will totally prevent damage from large grasshoppers because they have to feed on the plant in order to pick up enough insecticide to die. Additionally, even the pesticides with the longest lasting residues will have to be sprayed at 3- to 4-day intervals when large numbers of large grasshoppers are constantly invading a landscape.

Biological control: Several botanical and biological products are sold to manage grasshoppers. Nosema locustae is a protozoan microbe that causes disease in grasshoppers. Its resting spores are mixed into a bait which is then spread in areas with grasshoppers. The grasshoppers eat the bait and microbe spores, which then infect and kill the grasshoppers. Under the best conditions, these products can provide 30-40% mortality of grasshopper populations and under the wrong conditions (low dose, large grasshoppers and high temperatures) will provide little effective control.

For more information on this or any other horticultural topic, you can contact your local OSU Extension Educator.

Raptors Released on Farms?

Earl H. Ward, Area Livestock Specialist

When someone tells me that they have released raptors on their farms, my mind pictures a horrific scene out of a Jurassic Park movie. Released them to control flies? How big are your flies? Hopefully what they released was the parasitoid Muscidifurax raptor. This tiny black wasp is a natural enemy of the common flies found around barns.

Parasitoids are a natural biological control of flies. They have no other interest in any other animal besides flies, which makes them safe to humans. The parasitoid populations that naturally occur are typically not enough high enough to manage fly populations due to the flies' shorter development time and higher reproduction rate. The fly develops twice as fast, lives longer, and lays more eggs than the Muscidifurax raptor parasitoids. Because of this uneven biological reproduction, parasitoids need to be released continuously throughout the fly season.

The "fly predators" only live to find and kill fly pupae. The female parasitoid has a stinger but only can use it to kill flies. She will find a fly pupa, sting it, and feed on it. She then lays an egg inside the pupa, the egg hatches, and the new parasitoid larva feeds on the dead fly pupa. The whole life cycle is about three weeks long. These wasps are known to deposit its eggs into 10 different species of dipteran pupae, which include the house fly, the face fly, the secondary screw worm, the horn fly, and the stable fly. With ideal conditions a single female can on average lay her eggs into 13 house fly pupae per day and a total of 100 throughout her life.

Feedlots, dairies, and other livestock operations with animals in confinement are looking to alternatives to chemical control of flies due to the resistance that flies are developing to those products. The parasitoids are also very susceptible to chemical control and do not seem to develop any resistance due to their short lifespan. So, if you are using parasitoids it is recommended to use bait stations.

The costs of parasitoids will vary depending on how many wasps you need to cover the number of animals that you have. However, it is an option for livestock owners to consider, especially if they are seeing a decrease effectiveness of their chemical control.

It is important to know that there is no single product for long term management of flies, but perhaps these wonderful warrior wasps can help decrease the number of flies and the amount of pesticides applied to livestock who are in confinement. For more information on fly management contact your OSU Extension Educator.

Longevity and the Replacement Decision

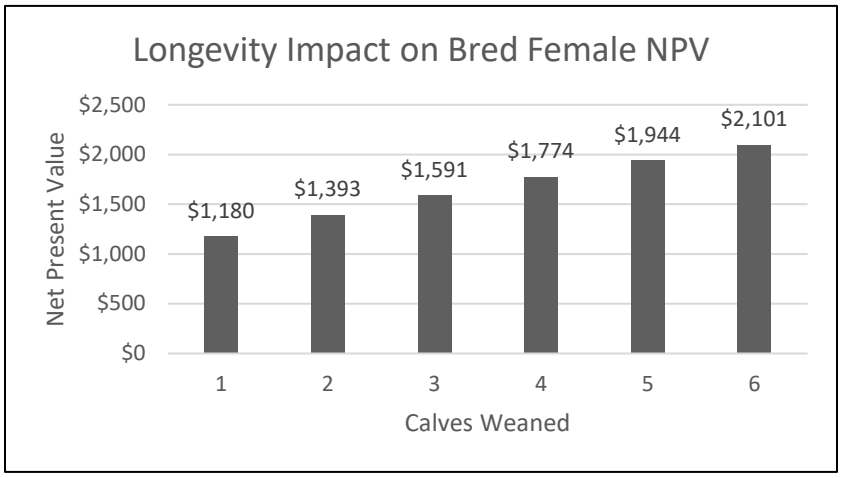
Scott Clawson, Area Agricultural Economics Specialist

Heifer retention or expansion of an operation can be one of the most difficult tasks to analyze. The variables are endless between commodity inputs, cattle prices, management strategies, and cost structures. Entering this point in the cattle cycle information starts circulating about what bred females are worth. Calf revenues, weaning percentages, cash costs, cull values, and longevity are all very important variables. To make it more frustrating, each one of the variables above has variables of their own. A common component that is highly variable is longevity and our estimation of it can make a big impact on the investment.

It is not breaking news that those cows that are productive for a high number of years are some of the most profitable on the place. The table below illustrates that concept from a strictly numbers standpoint. Using net present value (NPV) to give us a measurement of what the investment in this asset is worth today, the impact of the number of productive

Key Assumptions:

- $1,000 average calf revenue annually
- $675 per cow cash expense
- $700 revenue when culled
- 8% discount rate



years is obvious. The more years she is in production, the greater the returns over time and the more she is worth today. The real question is not if longevity is important. It certainly is. The question is that of this group of heifers, what will be the average longevity of the group?

Let's assume that we can buy a set of bred heifers for $1,750 per head. These heifers will calve in the spring as a two-year-old and sell a weaned calf in the fall of that year. Our assumptions above would indicate that she would need to wean a minimum of four calves to be a profitable investment. The chart above tells us that we could pay up to $1,774 for a female that would wean four calves, since we paid $1,750, we would be in the black on the purchase.

This brings up another question. How long should we expect her to be in production? Replacement rates vary from 10-20% on average. A 15% replacement rate would suggest that the cowherd turns over roughly every 6.5 years. The USDA National Animal Health Monitoring System Report released in May 2021 reports that 16.4% of cows culled were under 5 years of age and 35.3% were 5-9 years of age.

When considering what to pay for replacements or how much to spend developing your own, expected longevity is a key component of the decision. It is a highly variable measure. So, what do your records tell you about longevity in your operation? As replacement values surge in this market, make sure that your estimate matches your ranch's history, and that we are projecting a longevity number that is closer to our ranch's documented average than the exception. For more assistance in determining this for your specific operation, contact your local OSU Extension Educator.

USDA National Animal Health Monitoring System, Beef Cow-calf Health and Management Practices in the United States, 2017. https://www.aphis.usda.gov/animal_health/nahms/beefcowcalf/downloads/beef2017/beef-2017-part2.pdf

EXTENSION

Value of Gain Calculation

OK Weighted Average Report 6/30/23

Weight	$/lb	Value/hd	Added lb.	Added $	$/lb Added
325	$ 2.9828	$ 969.41			
380	$ 3.0893	$ 1,173.93	55	$ 204.52	$ 3.72
432	$ 2.8792	$ 1,243.81	52	$ 69.88	$ 1.34
471	$ 2.8067	$ 1,321.96	39	$ 78.14	$ 2.00
528	$ 2.5911	$ 1,368.10	57	$ 46.15	$ 0.81
582	$ 2.5436	$ 1,480.38	54	$ 112.27	$ 2.08
628	$ 2.4931	$ 1,565.67	46	$ 85.29	$ 1.85
679	$ 2.4253	$ 1,646.78	51	$ 81.11	$ 1.59
728	$ 2.4085	$ 1,753.39	49	$ 106.61	$ 2.18
778	$ 2.3516	$ 1,829.54	50	$ 76.16	$ 1.52
826	$ 2.3005	$ 1,900.21	48	$ 70.67	$ 1.47
881	$ 2.2877	$ 2,015.46	55	$ 115.25	$ 2.10
968	$ 2.1745	$ 2,104.92	87	$ 89.45	$ 1.03

Long Stocker Run		**Short Stocker Run**		**Heavy Stocker Run**	
Starting		*Starting*		*Starting*	
325	$ 969.41	325	$ 969.41	628	$ 1,565.67
Ending		*Ending*		*Ending*	
968	$ 2,104.92	528	$1,368.10	968	$ 2,104.92
Total Gain	*Δ Value*	*Total Gain*	*Δ Value*	*Total Gain*	*Δ Value*
643	$ 1,135.51	203	$ 398.69	340	$ 539.25
VOG		*VOG*		*VOG*	
$ 1.77		$ 1.96		$ 1.59	

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