



Pinkeye and Fly Management Made Easier

Kathy Voth and OnPasture.com

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Table of Contents

Click on any page number to start reading

The Easiest Way to Treat Pinkeye	<u>4</u>	What Dung Beetles Do for us and How You Can Have More of Them	<u>19</u>
What does pinkeye look like?	<u>4</u>	Reduce fly problems	<u>19</u>
Causes of pinkeye	<u>5</u>	Make more forage available to livestock	<u>20</u>
So, what do you do?	<u>5</u>	Put nitrogen in your soil	<u>20</u>
As for treatment...	<u>6</u>	Adding dung beetles to your pasture	<u>20</u>
An important note on a variant	<u>7</u>	Dung beetle suppliers	<u>21</u>
 Fly Management to Prevent Pinkeye	<u>8</u>	Collect your own	<u>21</u>
Know the enemy	<u>8</u>	Do you know your dung beetles?	<u>21</u>
Managing for fewer face flies	<u>9</u>	Dung beetle pictures	<u>22</u>
Catch and Kill- Farmer hacks that work!	<u>9</u>	Dung beetle fun	<u>23</u>
Minimize the use of pesticides and		 Culling to Reduce Fly & Parasite Problems	<u>24</u>
Worming medications	<u>11</u>	 More Grazing Resources	<u>29</u>
Keep the herd moving	<u>11</u>	 About the Author	<u>30</u>
 Horn Flies and Stable Flies	<u>12</u>		
Horn flies	<u>12</u>		
Stable flies	<u>13</u>		
 Garlic for Fly Control	<u>14</u>		
Do cattle like the taste of garlic?	<u>16</u>		
Where to get it and how to mix it	<u>16</u>		
 Parasitoids and Birds as Management Tools	<u>17</u>		
Adding parasitoids to your farm/ranch	<u>18</u>		
The bluebird of happiness	<u>18</u>		

The Easiest Way to Treat Pinkeye

On a farm visit to Greg and Jan Judy's place, I asked Greg "How do you treat pinkeye?"

"We don't treat it," he said. "We found that if we treated it the cow got better in 2 or 3 weeks. If we didn't treat it, the cow got better in 2 or 3 weeks."

His response sounds like an old saying I heard from a South Dakota rancher, "You can treat pinkeye and it will get better in a week. Left untreated it will be better in 7 days."



[Greg Judy](#) is a well-known, very successful grazer who shares his experience and tips for success in books, videos and workshops.

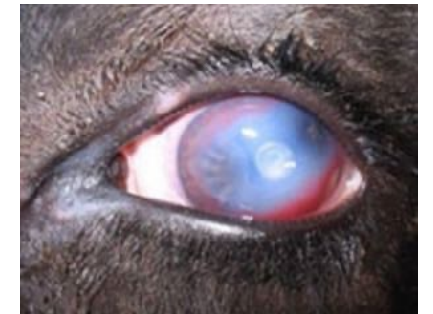
What does pinkeye look like?

There are three stages of pinkeye. It can clear up at any stage, but severe cases go through all three stages.

Stage 1: Excessive tearing and sensitivity to sunlight. The white spot in the center of the cornea in this picture is a small ulcer. The cloudiness of the eye is due to inflammation.



Stage 2: The ulcer spreads across the cornea. Blood vessels grow across the cornea to help with healing. This makes the cornea look pink and gives the disease its name.



Stage 3: The ulcer covers the cornea and the inflammation spreads to the inner parts of the eye. The yellow color is due to a pus-like substance called fibrin.



Causes of Pinkeye

Moraxella bovis is the bacterium responsible for pinkeye and is found in the eyes of recovered and healthy cattle alike. But the bacteria alone doesn't necessarily cause pinkeye. It seems that there needs to be some kind of added irritation. So flies moving from cow to cow, tall grasses rubbing their eyes, dust and foreign objects in the eye, and ultraviolet (UV) sunlight are all considered potential factors in pinkeye. This last makes breeds without eyelid pigment more susceptible. Calves, especially bull calves, are also more likely to catch pinkeye while adult cattle develop protective antibodies on their eyes' surfaces.

According to Kevin Gould of Michigan State University Extension, how well an animal works through pinkeye can be influenced by things like "nutritional imbalances, such as deficiencies of protein, energy, vitamins (especially vitamin A if the forage is lower quality) and minerals (especially copper and selenium)." He adds that, "The presence of other organisms such as the infectious bovine rhinotracheitis (IBR) virus, mycoplasma, chlamydia and *Branhemella ovis* will increase the incidence and severity of disease.

So what do you do?

Out of curiosity, I visited a listserv where farmers and ranchers were sharing their experience with pinkeye. All agreed that prevention was the best cure, describing the different rubs and fly tags they use. A South African farmer wrote, "What really worked for me was a farmers recipe I got mixing 5 liters of petroleum gel with 150 ml of Zeropar from Bayer Animal Health and rubbing it on the animal's face, one handful will do." (Zeropar is only available in South Africa and it is a dip or hand spray that controls itch mites, ticks, lice, blowflies and screw-worm infestations.) A Tennessee farmer said keeping cattle from spending too much time around water was a key. "If they have access to a pond, try to stop that because that only makes the flies worse and almost impossible to fight."

One fellow complained that he thought the vaccines for pinkeye were "water," and he's not too far wrong. "The pinkeye vaccine has been disappointing as the sole means of controlling pinkeye," says Gould. "There are over 20 strains of the *M. bovis* bacteria and continuous mutation occurs in the bacteria. While the vaccines contain the most common strains of *M. bovis*, they do not contain all the strains that occur."

As for treatment...

If you don't go for no treatment at all, antibiotics are the most recommended treatment. Gould recommends tetracyclines at 4.5 cc per 100 pounds of bodyweight injected subcutaneously or in the thin membrane that covers the white of the eye (the bulbar conjunctiva). Sometimes a patch is added to keep the eye from being further irritated.

On another listserv I read a discussion of salt as a treatment. The writer said old timers told her to throw salt at the animals' eyes. A respondent told her not to do that as it just makes the cows mad, and suggested, like Greg, to not treat it at all and the animals would get well.

Preventing Pinkeye

Gould agrees with the farmers and ranchers on the importance of prevention and says, "Management practices that reduce the risk factors associated with pinkeye are the most effective tools in decreasing the incidence of disease."

Gould suggests a variety of pours and rubs to kill and control flies, but for many of you, concerned about how dung beetles and other insects contribute to your soil

health, that may not be an option. We'll talk more about management options in the next chapter.

You can purchase patches to cover eyes, or you can be creative like the grazer in the second picture below.



Jodi Kendrew, DVM, Alberta Canada adds this important note on a new variant:

A new strain of pinkeye has emerged. Historically the main cause of infectious bovine keratoconjunctivitis (aka pinkeye) in cattle was *Moraxella bovis*. Unfortunately for cattle and cattle producers, Western Canada has identified the related bacteria *Moraxella bovoculi* as an additional cause of pinkeye.

Moraxella bovoculi outbreaks are very aggressive and do not respond well to treatment. The symptoms are virtually identical as *Moraxella bovis* infection. In my own herd, I have had morbidity rates (percentage of the populations with symptoms of disease) of 100%, and animals having clinical symptoms more than once and in more than one eye. Animals severely affected appear to sometimes become carriers, shedding bacteria during times of stress. It is fair to say the *Moraxella bovoculi* outbreaks in our herd have been equally bad in winter (REAL winter!! NO FLIES) as in summer, and in the summer we noted no difference with fly control vs no fly control.

As discussed by previous posters, ensuring your herd is not deficient in vitamins and minerals is also very important at this time to aid the animal's immune system.

If you are experiencing a severe outbreak, consult your veterinarian to discuss diagnostics and subsequently treatment options.....you may need to handle a *Moraxella bovoculi* outbreak differently than one caused by *Moraxella bovis*.

Fly Management to Prevent Pinkeye

July is usually when graziers begin having more trouble with Pinkeye.

Why July? Well, that's when fly populations seem to reach their peak, and one fly in particular, the face fly, is a big part of spreading pinkeye through a herd. That means a good way to reduce pinkeye in your herd is to understand how these flies contribute to the problem, and what we can do to reduce their populations.

Know the Enemy

It's hard to tell one fly from another just by looking at them, but their preferred home on a cow is a dead give away. Face flies (*Musca autumnalis*) get their name because they prefer a cow's face, and in particular, its eyes. Why? A female fly feeds on the mucus and saliva around the eyes and nose to get the protein she needs for egg development. If there's not enough she'll poke around the eyes irritating them so they tear and give her what she's looking for.

As you've already guessed, this is a perfect way to spread pinkeye. In fact, the bacteria that causes



A Face Fly has sponge-like mouthparts to soak up liquids along with small rough spines (prestomal teeth) to irritate the eye and cause tearing. Photo courtesy of Janet Graham, Wikimedia Commons.



Face flies at home. Just 10 flies on the face at a time are enough to reduce animal productivity. Photo Courtesy of Clemson University, USDA.

pinkeye, ***Moraxella bovis***, can survive up to 3 days on external surfaces and 2 days in the gut of face flies. That means one face fly can cause a lot of damage.

Once she's gotten enough protein for her eggs, the face fly female lays her eggs in fresh manure. From egg to adult takes just 12 to 20 days, depending on the weather. Eggs hatch in one day, larvae develop in 2 to 4 days, and when mature, they leave the manure to pupate in the surrounding soil. Face flies winter over in buildings or other protected spaces spending their time in "diapause," a kind of suspended or arrested development state.

Managing for fewer face flies

According to the [Merck Veterinary Manual](#):

"Control of face flies is difficult. Much effort has been made using various insecticides and application techniques, such as dust bags, mist sprays, and wipe-on formulations. Also, insecticides and insect growth regulators are used as feed additives. However, results are usually less than satisfactory. The introduction of insecticide-impregnated ear tags has provided somewhat better control, but generally, seasonal face fly reduction of only 70%–80% has been achieved, even with two tags (one in each ear) per animal."

Other sources point out that fighting face flies with chemicals requires large dosages and chemicals become less and less effective as the flies become resistant to pesticides.

That leaves management as the best tool for reducing face fly populations. Here are some options:

Catch and Kill

New York Farmer Fred Forsburg built a better fly trap after watching fly behavior. He noticed that when his cattle dipped their heads into the water trough to drink, the flies lifted off and landed nearby to wait until it was safe to return. Fred realized that if he set up a board with fly paper near the trough, he'd be able to catch the flies. Since most of the flies on his cattle's faces are female, he'd eliminate her and her potential progeny. It's inexpensive, easy, and effective. Fred notes that he catches about 2,000 flies a day.

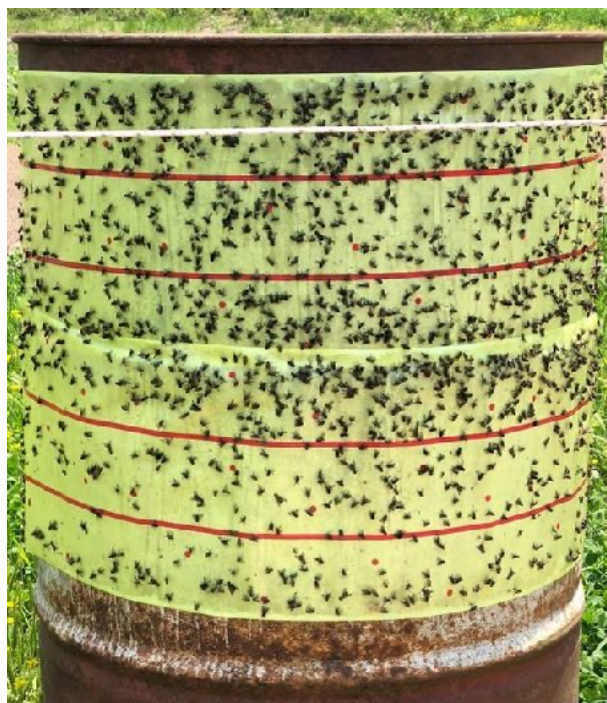


Here's Fred's set up. The board with the fly paper is set up against the back of the water trough.

Chris Hollen and Loran Shallenberger are members of the reGenerative Grazing Facebook group. They worked up their own version of this fly catcher using a barrel wrapped in fly paper. Here's his set up:



And here's what it looked like 24 hours later:



Kevin Swalley is another member of the group using this method and he provides these instructions for setting up your barrels: "Its only sticky on one side. Just make a wrap around the barrel and overlap the ends a little to stick the paper back to itself. I just started wrapping over the old paper with the new. A sharp knife will cut through it to throw it away."

Kevin says that he caught face flies, horse flies and deer flies. The chickens would eat every fly they could reach on the paper. He also found that "there were more flies toward the top of the barrel every time. So I just started flipping the barrel upside down. It seemed to do the best at waste level to chest high on me."

When the topic first came up in the group, Kevin says that most folks kept the barrels outside the fence so that cows wouldn't get stuck to it. He started moving it with the cows and didn't have any trouble with cows touching it. He even wrapped some trees and fence posts with the fly paper.

The fly paper Chris, Iran and Kevin are using is generally available at farm supply stores. Fred



Forsburg preferred something less flimsy and apt to stick to him as he was trying to put it up. He found Catchmaster Glue Trap paper. You can find it online here:

[Do It Yourself Pest Control](#)
[Wildlife Control Supplies](#)
[Oldham Chemical Company](#)

Here's another method using a barrel in a different way. Kevin Jahnke has a seasonal dairy farm in Lancaster, Wisconsin. He builds these blue barrels that use a smelly attractant to draw the flies into the barrel. He cuts a hole in the top of the barrel and covers it with clear plastic making a window of light that the flies go towards so that they don't find their way back out. He empties the barrels from time to time. The last time he did it he filled a 5-gallon bucket and estimates he got about a million flies.



[Click to watch video.](#)

Minimize the Use of Pesticides and Worming Medications

Chemicals designed to kill flies also kill insects that are beneficial in reducing fly populations. By reducing the use of these insecticides, we have more dung beetles and dung beetles are helpful in removing manure patties so flies have fewer places to lay eggs and grow their young.

You might also get help from Yellow Dung Flies. Male flies spend most of their time on manure piles, waiting for females and feeding on other insects like the flies that come to lay their own eggs. They help reduce fly populations, and their larvae eat manure as they grow.



Yellow dung flies, photo by James Lindsey Wikimedia Commons

Keep the Herd Moving

Moving herds to new pastures has been prescribed as another tool for keeping flies off cattle. The theory is that when the flies rise up mature out of the ground near their manure pat homes, the cows will already have moved on. The problem with this is that face flies are strong fliers, traveling as much as 5 miles to find the face of a cow. But this in combination with one or more of the other steps listed here is helpful to the overall problem.

Horn Flies and Stable Flies

Face flies aren't the only problem our livestock have. Here are two more varieties along with tips for controlling them.

Horn Flies (*Haematobia irritans*)

If your cattle have flies on their shoulders, backs and bellies, they're suffering from horn flies. These flies bite their host to obtain blood meals, feeding 24 to 38 times a day. After mating, the female takes a break from riding around on the cow, and heads to the nearest manure pile to deposit her eggs. She can lay from 100 to 200 eggs in her short seven-day life. Her offspring continue the cycle. Eggs hatch one to two days after being deposited and begin feeding on manure. From hatch to the adult stage takes 10 to 20 days. Adult flies begin mating three to five days following emergence...and so on.



Horn Flies, photo courtesy of [wikimedia.org](https://www.wikimedia.org)

All told the fly lives only three weeks, but it can do a lot of damage in that time. Dairy cows' milk production decreases at just 100 flies. At 200 flies, beef cattle weight gains are reduced. Animals may bunch together and change grazing patterns as a result of fly irritation.

Control methods for Horn flies range from chemical to mechanical to biological. Many graziers resort to insecticide impregnated eartags or insecticide-coated back rubbers and dusters. Mechanical traps are another option. Horn flies don't like dark areas, so they leave the cow as she walks through the trap. The flies are then electrocuted or trapped on sticky tape, reducing fly problems by about 50%. For those interested in non-chemical control, rotational grazing can help somewhat, as can selecting animals that seem to attract fewer flies, and culling those with the heaviest fly problems. Supplements are also an option. Garlic mixed with loose mineral salt has proven effective in reducing horn fly numbers. You can read more about how to use garlic in the next chapter. Skip to the section on Parasitoids and Birds for more on biological control of flies.

Stable Flies (*Stomoxys calcitrans*)

If you see your cattle stomping their feet during warm summer months, it might mean they're dealing with stable flies. Stable flies look a lot like house flies, but they are blood-suckers with bayonet-like mouthparts they use to pierce the skin. They prefer feeding on the bellies and legs of their victims,



Adult stable fly (Pavel Krok, Wikimedia Commons)

which include horses, cattle, hogs and humans. Though they only take a few drops of blood at a time, their bites are so painful that cattle stamp or kick to try to rid themselves of the pests. Just fifty flies per animal can reduce feed efficiency by 10 to 13 percent.

Each female lives 20 to 30 days and produces about 500 eggs. It takes about 3 weeks for the egg to become an adult fly. Their preferred breeding and growing habitat is hay ring feeding sites, or in any moist, decaying organic matter such as: silage, crop residue, hay, grain, manure and soiled animal bedding. Decomposing bedding provides prime stable fly developmental habitat. Consider using wood shavings as they don't decompose or become compacted as quickly once soiled.

To reduce stable fly populations, you reduce breeding habitat. By thinly spreading these organic materials, you kill maggots and reduce breeding habitat. If your stable fly problem is actually in a stable or barn area, fly tape is a great go-to solution. Parasitoids are another option. Read more in the upcoming section on them.

Garlic for Fly Control

While different folks prescribe different supplements for keeping flies off, the only one that comes with actual evidence is garlic. According to Canadian research in 2017, cows fed trace mineral salt fortified with garlic powder had 52 and 56 percent fewer flies on average than the two control groups fed plain trace mineral salt.

Obi Durunna, a Prince Albert livestock specialist and his colleagues, Jenifer Heyden and Naomi Paley first looked for other research on garlic's effectiveness as a fly deterrent. All they found was one study that showed a mixture of salt and 2 percent garlic didn't reduce horn fly numbers. (Horn flies sit on the backs and sides of cattle and feed on their blood until mating day when they females leave to lay eggs in fresh manure.) Meanwhile, they'd also read producer testimonials that said it did work, and just as many that said it did nothing at all. With no clear answer they decided they'd run a test to find out for themselves.

They started with two groups of 150 cow calf pairs and one group of 115 pairs. Their pastures were just 3 kilometers apart to ensure that overall fly pressure would be the same. One group was given trace mineral salt mixed with 2.1% garlic powder (by weight). The other

two groups (one of 150 and one of 115) were given plain trace mineral salt. Both were fed in open tubs starting on May 25

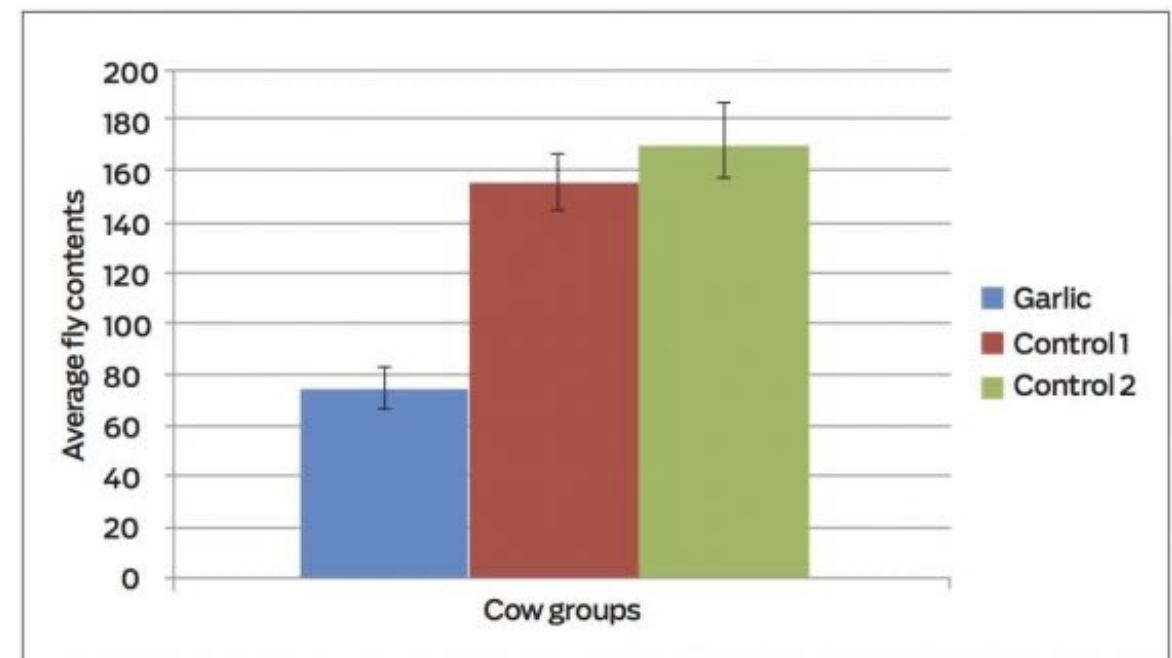
Next, they counted flies. Researchers took videos of each group between 10 am and 3 pm on June 1, July 6 and 21, August 10 and 30 and September 13. Then they pulled still photos of the faces and sides of the cattle from the videos and used the Adobe Photoshop count tool to count the number of flies in each photo. They also looked for the different types of flies. Stable flies stick mainly to legs, and face flies, of course, are on the face. From the videos, they could see that there were few face flies, but that horn flies were out in force.



Photo by Obi Durunna

The first count showed little difference between garlic cattle and the control groups. But 41 days later, the garlic cattle averaged about 100 fewer flies per cow than Control-1.

The average fly count on the Control-1 group was about 200 per cow. Control-2 averaged 200 per cow in July and neared 250 per cow on the August 10 count. Fly counts in all groups decreased after August 10 to the end of the trial on September 13.



The garlic group had the lowest fly count and showed the fewest fly avoidance behaviors (bunching, tail flicks, head throws, leg stomps and side licks). Interestingly, avoidance behaviors were highest at the beginning of the summer and decreased over time, even though fly loads increased.

Perhaps the cattle just got used to the flies or they figured out that the flies wouldn't leave no matter what.

Do cattle like the taste of garlic?

According to researchers, the cattle didn't seem to mind the taste of garlic, but it didn't encourage them to eat more salt. Daily consumption was within the expected range of .12 pounds per head per day for the garlic group and .18 pounds and .15 pounds for the two control groups. All told, the garlic group ate 88 pounds of garlic powder at at cost of \$1.46 per head. In comparison, the cost to treat animals with a long-acting pour-on insecticide would have been \$2.12 per head total for two treatments during the summer.

All in all, Durunna says that garlic powder was easy to feed and did reduce fly loads during the grazing season.

Where do you get garlic and how do you mix it with salt?

Some readers report that their local feed mills will add garlic to loose mineral salt mixes at a cost of about \$2 more per bag. Other readers head to Google and search for bulk garlic suppliers or restaurant supply stores.

And of course, there's always [Amazon](#) where you can get 5 to 7.5 pound jars for \$25 to \$35 and some options ship free. Mix a fifth of a five pound jar with a fifty pound bag of loose mineral salt and you're good to go. If you have more animals, you can buy in larger quantities.



[Click to see this item.](#)

US-FARMERS Natural Premium
Quality Granulated Garlic in Jar, 7 Lbs
7 Pound (Pack of 1)

★★★★★ ∨ 16

\$31⁹⁹ (\$31.99/Count)

FREE Shipping

Parasitoids and Birds as Management Tools

Both horn flies and stable flies have naturally occurring enemies. Beetles, mites and dung beetles all eat fly eggs. When it comes to horn flies, Dan Fitzpatrick and Phillip Kaufman of the University of Florida say “Dung beetles of the family Scarabaeidae, as well as other predaceous beetles of the families Staphylinidae and Histeridae, are important natural predators of larval horn flies in the manure.” They also note that the red imported fire ant, *Solenopsis invicta* Buren, are horn fly predators. Though that’s one good thing about fire ants, don’t try to introduce them to your landscape. Fire ants kill other predators and their stings are very painful for livestock and people.

There are also Parasitoid that can help with control of both horn and stable flies without causing and danger to people. These small wasp-like insects attack stable fly pupae. When the female finds a pupa she stings it and feeds on it, killing it. Next, she uses her stinger to lay an egg in the pupa. The egg turns into a young adult parasitoid feeding on the pupa and eating its way out of the shell to start the cycle all over again.

The problem for the parasitoids is that flies develop twice as fast from egg to adult, live longer, and lay more eggs. So if we don't intercede, we'll always have fly problems. Parasitoids also lag behind flies in developing

pesticide resistance so when we use pesticides, we kill more and more beneficials, and fewer flies. If you want to work with parasitoids, and you're also using pesticides be sure to check that your pesticide is compatible with them.

Adding Parasitoids to Your Farm/Ranch

Many companies sell parasitoids, but you need to be sure the kind you buy work in your region. You can check with your local extension entomologist to find out what will work best for you.

Your parasitoids will arrive as immature insects in killed fly pupae, often in cheesecloth bags. If you're targeting stable flies, hang these bags on posts and rafters in areas where stable fly breeding is a problem. If you're using them with calves in calf hutches, place 3 heaping teaspoons of pupae (about 1,000) in the hutch each week. You'll need about 200 per cow or 1,000 per calf hutch per week starting in middle to late May. (As always, results depend on local factors and the number and timing of your releases may need to be adjusted to meet your particular needs.)

Prices vary, but the average is about \$13 plus shipping per batch of 10,000 parasitoids. At a rate of 200 per cow per week, your cost will be between \$2.60 and \$4.70,

depending on how many weeks you release them.

Researchers have compared the cost of parasitoids and insecticide treatments and found that use of parasitoids reduces insecticide treatments by 80% and results in 50% fewer flies.

The Bluebird of Happiness

Birds can be great at helping control flies, so why not invite them to your pastures? Both Greg Judy and [Grass Whisperer Troy Bishopp](#) build and install bluebird boxes on their fence posts. It's easy, fun, the birds are fun to have around, and they work for free.

To get started, check out [Greg Judy's step-by-step video](#) on how to build tree swallow boxes. He shows you the best materials to use to make sure they're long-lasting, and shows you how to make them quickly and easily.



Photo by Troy Bishopp

What Dung Beetles Do For Us and How You Can Have More of Them



Troy Bishopp checks for dung beetles.

Troy Bishopp ([the Grass Whisperer](#) and On Pasture author) says that if he comes to visit your pastures, one of the first things he'll look at are the manure pats. Why? Because they can tell him a lot about the quality of what the cattle are eating, how often they're being moved, and even where they like to hang out. They can also tell him if you've got beneficial insects that are helping you manage pests. Yep, Troy will be looking for those signs that you've got dung beetles. In fact, the more I learn about these little bugs, the more time I spend looking at poop too

Here's what dung beetles do for us:

Reduce Fly Problems

As we mentioned earlier, horn flies and face flies both need manure pats to breed and incubate. Dung beetles destroy manure pats so that the flies have no place to party and their larvae have no where to live. Some research has found a 95% decrease in horn flies thanks to dung beetles. That's a big deal when you consider that horn flies can cause a 15 to 50 pound reduction in calf weaning weights. Some researchers estimate that farmers and ranchers spend \$60 million a year on controlling insects. So next time you see a dung beetle, thank it for helping save you money. (And for our

Australian readers, dung beetles are reported to reduce bush flies by as much as 90%!

Make More Forage Available to Your Livestock

Since livestock poop where they eat, that can mean that from 5 to 10% of the forage in a pasture is covered with manure and won't be eaten. That's not a lot but when your margins are slim, every little bit counts. Of course, you might also look at as forage that's being trampled and returned to the soil, and in that case it's all good.

Put Nitrogen in Your Soil

All that fertilizer that your livestock are scattering on pasture, and maybe even laying out in a more concentrated fashion with management intensive grazing, is a great start to improving the fertility of your soil. But you need dung beetles to complete the cycle. If left on the surface, 80% of manure



By Charles J. Sharp - Own work, from Sharp Photography, sharpphotography, CC BY-SA via [wikimedia.org](https://commons.wikimedia.org/wiki/File:Scarab_beetle.jpg).

nitrogen can be lost into the atmosphere. Dung beetles reduce that loss by quickly incorporating manure into the soil by rolling it up and hauling it underground, thus incorporating nitrogen into the soil.

The dung beetle's plan for those little poop pills is that they will feed its larvae. But the larvae use only 40-50% of the brood ball. The rest of that nutrient-rich organic matter is left behind for soil microbes, fungi and bacteria to use for creating humus. Between the nitrogen, the tunnels that increase soil's water-holding capacity, and the addition of organic matter to your soil, those little dung beetles are doing a lot of good work for you!

Adding Dung Beetles to Your Pastures

It's likely that you have dung beetles already, though you may not have as many as you'd like. You can increase their numbers by changing the way you currently manage for parasites in your herd. ***Reduce your insecticide use, and keep in mind that Ivermectin can reduce dung beetle survival.*** Research has shown that the injectable version reduces dung beetle survival for 1 to 2 weeks, and the pour-on reduces survival of larvae for 1 to 3 weeks. The bolus version is most harmful to dung beetles, with effects lasting as much as 20 weeks.

We found the following websites where you can purchase dung beetles do add to your pastures.

Australia:

[Dung Beetle Expert](#)

[Dung Beetle Solutions](#)

United States:

[Dung Beetles](#)

Collect Your Own

Keep in mind that it may be possible for dung beetles from one part of the country to bring pathogens with them. So it may be a safer bet to collect dung beetles locally. Here are instructions for capturing and moving dung beetles from Rincon-Vitova Insectaries. [Check out their web page](#) for additional information about monitoring your pastures for dung beetles.

Do you know your dung beetles?

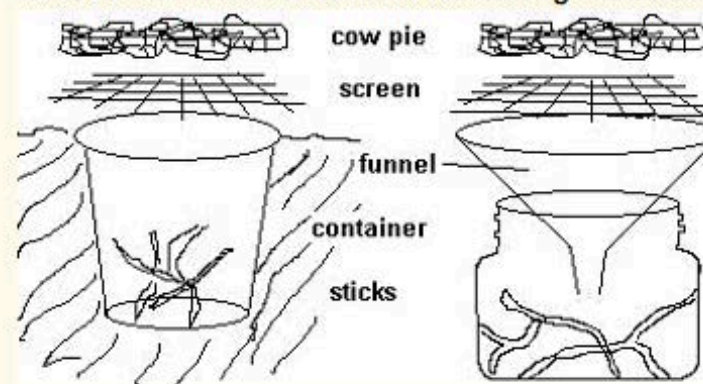
There are THOUSANDS of species of dung beetles, so we can't tell you what you might have in your area. Your best bet is to talk to a local entymologist or someone from your local extension, or Conservation District office. But, to give you a start for your first tour of your pasture, here are

Set Up Live Capture Traps

Pitfall Trap

1. bury a quart plastic container (like yogurt) level with soil, and place a second inside so it is easy to remove
2. place a wad of sticks in container so beetles can climb above water level in case of rain
3. place 1/2 inch hardware cloth (screen) over container
4. collect fresh manure (a lump the size of a chicken egg), wrap it in a double layer of cheese cloth. The cloth prevents the manure from dropping through the hardware cloth. (you can make up several dozen of these baits at a time, freeze them, and then pull them out as needed)
5. place cow pat on top of hardware cloth
6. check every day for beetles in container

To make it easier to remove beetles, use two containers. The first container is buried in the ground as pictured. The second container sits inside the first. To empty the trap, we just remove the inside container while leaving the other buried in the ground.



Funnel Trap

1. Place hardware cloth on funnel
2. place a wad of sticks in container so beetles can climb above water level in case of rain
3. Place small end of funnel in jar
4. place cow pat on hardware cloth
5. check daily

Pig and human dung considered best for traps. Add rain shield or rodent screening as needed.

examples of dung beetles found in North Carolina. Thanks to the folks at North Carolina State University for these pictures!



Aphodius distinctus
Size: 1/8-3/16"



Aphodius pseudolivinus
Size: 1/8-3/16"



Onthophagus gazella (♀)
Size: 3/8-1/2"



Onthophagus pennsylvanicus
Size: 1/8-1/4"



Onthophagus taurus (♂)
Size: 1/4-3/8"



Aphodius erraticus
Size: 1/4-3/8"



Geotrupes blackburnii
Size: 3/8-3/4"



Onthophagus gazella (♂)
Size: 3/8-1/2"



Onthophagus taurus (♀)
Size: 1/4-3/8"



Phanaeus vindex (♀)
Size: 3/8-7/8"



Aphodius fimetarius
Size: 1/4-3/8"



Onthophagus gazella (♀)
Size: 3/8-1/2"



Onthophagus gazella (♂)
Size: 3/8-1/2"



Onthophagus taurus (♂)
Size: 1/4-3/8"



Phanaeus vindex (♂)
Size: 3/8-7/8"

Onthophagus taurus (♂)
Size: 1/4-3/8"



Phanaeus vindex (♂)
Size: 3/8-7/8"

Phanaeus vindex (♀)
Size: 3/8-7/8"



Canthon pilularius
Size: 1/2-5/8"

Phanaeus vindex (♂)
Size: 3/8-7/8"



Dichotomius carolinus
Size: 3/4 - 1 1/4"

Pronunciation guide: There are no common names of these beetles. To make their names easier to understand, a pronunciation guide is provided.

Aphodius distinctus: A-fo-di-us dis-tink-tuss

Aphodius erraticus: A-fo-di-us e-rat-i-kus

Aphodius fimetarius: A-fo-di-us fim-a-tary-us

Aphodius granarius: A-fo-di-us gran-air-e-us

Aphodius pseudolivinus: A-fo-di-us sue-doe-liv-i-dus

Canthon pilularius: Kan-thon pie-loo-lary-us

Copris minutus: Koe-pris mi-nu-tus

Dichotomius carolinus: Dik-o-tomee-us carolin-us

Geotrupes blackburnii: Geo-troop-eze black-burny-eye

Onthophagus gazella: On-tho-fa-gus ga-zell-a

Onthophagus hecate: On-tho-fa-gus heck-ate

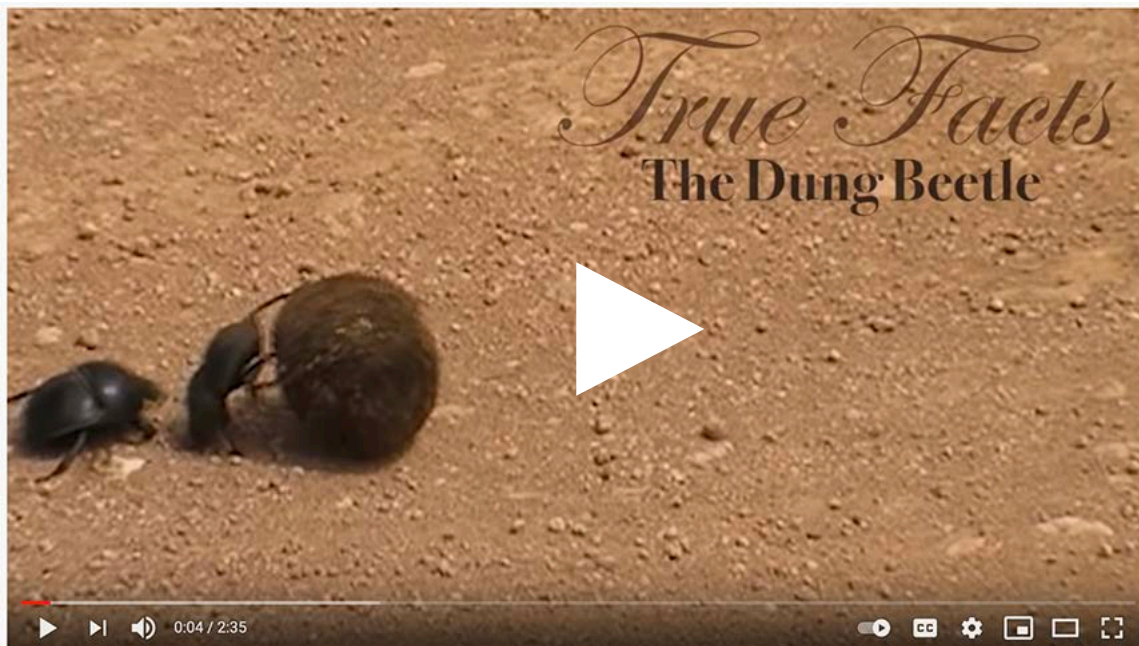
Onthophagus pennsylvanicus: On-tho-fa-gus pen-sill-van-i-kus

Onthophagus taurus: On-tho-fa-gus tore-us

Phanaeus vindex: Fan-ny-us vin-dex (Rainbow beetle)

Finally, here's a little dung beetle fun.

This video always makes me laugh. While the narrator has some issues with what the dung beetle does and how it does it, there's some great information in here about the life cycle of the dung beetle. Enjoy!



[Click here to play video.](#)

Culling to Reduce Fly & Parasite Problems



Arlen Chip Hines
October 24, 1942 -
October 12, 2020.

This chapter is by Chip Hines, a rancher, grazer, philosopher and mentor.

Chip contributed a lot to On Pasture's success in the early days and I am indebted to him for his kindness and support.

Though Chip has left us, we can still learn from him. You can [read all of his articles for On Pasture here](#). Some are excerpts from his books, which you can still buy or read in digital format. They're included in the list of books by On Pasture authors that [you'll find here](#).

Once again we have to go back in time. Cattle in the wild would have had as much parasite resistance as present day wild animals, which made their existence possible.

What we have done in the modern world is ignore natural capabilities and we unwittingly began diminishing them to insignificance.



Chemicals vs Culling

Are you using chemicals? Why? I suspect because you do not realize another way exists, and all the magazine ads and articles say you must.

Chemicals will never win the battle with parasites.

Parasites can be controlled by genetics, which is not only lasting, but cheaper.

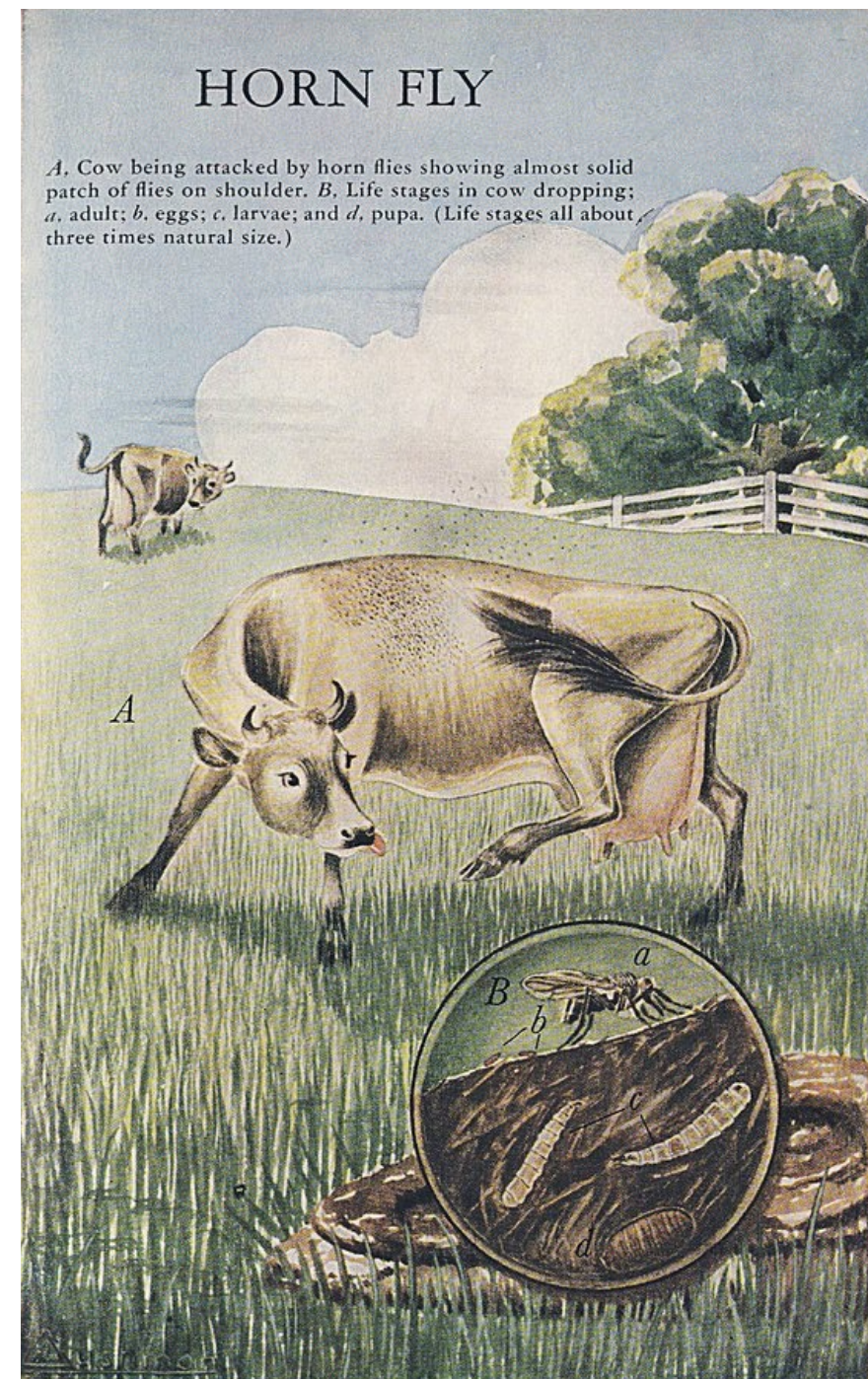
Genetic progress is dependent on culling, whether by death, as it is in nature or by turning the offender into cash. If the weak did not fall by the wayside in nature, the whole species was in trouble. We have been protecting the frail with chemicals instead of sending them to town. There is still a reservoir of genes to work with, but without someone marking the culls, we can't access that gene pool.

As in all the other aspects of management, the hard part is convincing your brain to see this in the true light and shut out the propaganda (spelled advertising). The chemical companies do not want you to even suspect there is another way.

Lice, Flies and Stomach Worms

Some parasites such as lice are much easier to control. It is obvious which cattle are carriers and you just need to trade them in for cash. There are usually just a few carriers so only a small number of cows need be sold.

Flies present a little different problem as every cow is attacked. It is noticeable though that some cows attract fewer flies than others. Track those cows and mark them for saving replacement heifers if everything else is okay, and do not keep heifers from those with heavy fly loads. As research by Dayton Steelman tells us, the heritability of fly



From "The Yearbook of Agriculture" 1952, published by the United States Department of Agriculture

resistance is very high, so you'll be on your way to a more fly resistant herd. This may be slow, but start anyway. A battle cannot be won without a beginning.

Cows with stomach worms (gastrointestinal nematodes) or (GI) are not as easy to detect, but the same culling regimen used with lice and flies is still very effective. In 2002 I found notice of a research program at the USDA Agricultural Research Center at Beltsville, Maryland. This was a four-year project to use the host immune system to reduce GI nematodes. Though the study was not published as a formal paper, the information the researcher put together is still valuable.

They noted that early results demonstrated the bovine immune system effective in reducing the number of parasites established in the host. One exception was *Ostertagia ostertagia*, but even with this species, the immune system reduced transmission by reducing egg count. The study indicated that it is feasible to control nematode infections by using the host immune system. Recently we have proven that host genetics plays an important role in determining if individual cattle become immune or not. We should cull those with weaker immune systems.



This illustration from the same 1952 Yearbook of Agriculture is on a background showing a tanned hide with grub damage, with a lifecycle diagram showing fly eggs attached to the hair of the animal, the grub damaging the hide, and the fly that starts the cycle again.

Although the anthelmintics currently used to control the parasites are efficacious and safe, there are increasing concerns that within a very short time period such control programs will be inadequate. The researchers suggested that we should “change the current perception that the economic effects of the parasites are normal expenses of the livestock raising system.

Instead, they suggested that a more feasible and economically viable alternative to heavy anthelmintic usage is to use the host immune system and the diversity of the host genome to control disease severity and transmission. Resistance to gastrointestinal nematodes is strongly influenced by host genetics and a few genetically susceptible animals are responsible for most parasite transmission. As important genes are identified, this information will allow culling of animals highly susceptible to parasite infection, reduce the numbers of parasite eggs on pasture and thus reduce the need for anthelmintic use.

The only way to get relief from the high input costs of fighting parasites with chemicals is to rely on nature.

Genetics is long term. Chemicals are only temporary.
Management is all you need, along with a resolve to stick to

it and not revert to the short-term tactics of chemical warfare.

Do not let a lack of knowledge about genetics keep you from making a move to the non-chemical battle against parasites. You do not need be a PhD to run this program. Nature has it all figured out, so follow that model, use no chemicals and cull those that fail.

Set up a strict culling program that will eliminate all genetic problems.

Producers must accept that many of the problems associated with cattle are genetically related, and can be controlled. This can be done with management which will also save money. Chemicals may be needed for a short time or in small doses, but not on a continual basis. There is no reason to allow those selling inputs to direct your thoughts and actions.



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About the Author

Kathy Voth has been working with livestock producers for 3 decades. She's known for her work developing a handbook on CD on the logistics for using goats to graze firebreaks, and for creating a method to teach cows (and other livestock) to eat weeds.



Kathy is the founder and publisher and primary author of On Pasture, an online magazine that translates research and experience into practices graziers can use to be more sustainable and profitable.

