

**Water Quality Enhancement Activity – WQL18 – Non-chemical pest management for livestock**



**Enhancement Description**

The use of management, monitoring, and preventive techniques to manage external livestock pests without the use of pesticides.

**Land Use Applicability**

Pastureland, rangeland and forestland

**Benefits**

Environmental benefits will be operation specific. Benefits may include, but are not limited to improved animal health, reduced risk to humans

and improved water quality.

Pests and parasites can have a significant impact on the economic viability of livestock operations by affecting the performance and health of animals. The improper use of chemical control methods can pose risks to animal and human health as well as water quality. Non-chemical pest management strategies will require increased monitoring and management of livestock which should result in a higher overall level of management efficiency.

**Criteria**

1. Prepare a written plan addressing basic management considerations, including:
  - a. Pests/parasites of concern, including correct species identification
  - b. Monitoring process (jug traps, baited cards, on-livestock counts, fecal egg counts, FAMANCHA, etc) to determine when control is needed and to monitor control effectiveness
  - c. Sanitation, cleaning feed/hay sites, and manure removal to reduce breeding sites
  - d. Rotational grazing and how it will be used to disrupt pest life cycles, minimum residual forage height to reduce parasite ingestion.
  
2. Incorporate two or more of the following applications into the plan as appropriate:
  - a. Provide non-invasive plants with secondary compounds such as tannins and terpenes that can reduce internal parasites when grazed by livestock.
  - b. Provide for multi-species grazing to disrupt life cycles of host specific parasites.
  - c. Monitor dung beetle populations and enhance by eliminating or significantly reducing use of detrimental injectable, pour-on, and especially bolus type pesticides.
  - d. If dung beetle populations are essentially non-existent, harrow or otherwise mechanically treat manure piles to speed up drying and decomposition.
  - e. Incorporate pastured poultry, such as portable poultry wagons, into pasture rotations to eat fly larvae, 2-3 days after livestock leave pasture.



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- f. Enhance populations of martins, swallows, and bats by providing roosts, nesting, and breeding sites as appropriate.

**Documentation Requirements**

1. Written plan that includes basic management considerations and specific selected prevention and monitoring techniques performed, including dates, effectiveness of applications, and other monitoring results.
2. Schedule of when grazing occurred on pastures and residual vegetation heights both at start and end of each grazing period.

## Michigan Supplement

### Animal Enhancement Activity - WQL18 - Non-Chemical Pest Control for Livestock

Successful pest management is the avoiding or reducing of opportunities for pests through overall management combined with sanitation practices.

#### Livestock Pests of Concern

Known livestock external pests in Michigan include horn, house and stable flies. Methods of fly control are described below. Horse and deer flies can be serious pests however the extent of infested areas is usually limited to wet sites or pastures near water. Lice, ticks, scab mange and other external pests exist but require pesticide treatment for effective control.

Internal parasites of livestock include stomach worms (roundworms and nematodes), tapeworms, lungworms, liver flukes, and coccidian. The barber pole worm, a round worm, is responsible for most losses in ruminants. Horse bots are parasites to the horse and related stock.

#### Pest Control Methods

Sanitation is the first and most important step in controlling flies and internal parasites. Sanitation is cheaper than relying on insecticides and eliminates residue problems or immunity buildup.

- Eliminate breeding areas. Both stable and house flies breed in moist areas; straw and manure; moist, spilled feed and malt; manure drains or leaking water cups; and decaying vegetation around the premises. Stable flies are believed to overwinter in manure.
- Keep undisturbed manure as dry as possible. Along feed bunks, under fences, around waterers, and between pens or alleyways are ideal fly breeding areas. Keep waterers in good repair to avoid leaks. Grad lots and alleys to provide good drainage.
- Scrape empty pens, alleys, and fencelines to remove as much manure as possible and to improve drainage.
- Clean up spilled feed, decaying hay and silage.
- Control weeds to remove fly nesting areas.
- Certain manure management practices provide for manure storage under cages of poultry houses for long periods. If this is done in a manner where manure is subject to constant drying (which renders it nearly uninhabitable by flies), then the fly problem will be kept to a minimum.
- Where practical, spread manure thinly over fields under drying conditions, or heavy applications should be disked or shanked as liquid manure into the soil within 24 hours.
- Keep entryways clear of garbage cans or other fly-attracting material. Keep garbage or organic refuse cans tightly covered.
- Light traps, baited traps, and sticky tapes are physical controls for flies in barns.

On pasture, to limit fly production, avoid large accumulations of residue and moisture at feeding sites. Proper cleanup and removal of residue may be necessary. Clean and dispose of waste prior to the beginning of the fly production season.

Other practical sanitation methods on pasture include:

- Continual physical movement of feeder locations between feedings.
- Rolling hay out in different locations throughout the pasture.
- Avoid using poor quality or rotted hay that will not be eaten.
- Avoid overfeeding regardless of feeding method, to prevent trampling and soiling of hay. Grinding hay may help prevent sorting and decrease waste.
- Feeding locations should have adequate drainage to keep moisture from accumulating around the feeder.

Once a good manure management system is in place, releasing parasites can be considered. Commercially available parasites attack house and stable flies.

- Parasitic wasps should be periodically released before and during the fly season. Begin fly prevention programs early in the season. Once flies are established and population levels build up, control becomes difficult.
- Select the right parasite. The two main groups of parasites are *Spalangia* and *Muscidifurax*. *Spalangia* appears to be the appropriate parasite for both stable and house flies. *Muscidifurax* appears to only control stable flies.
- Use quality products. Viability and purity of the parasite product are important. Find a reputable supplier that understands livestock fly problems and check to ensure shipments are viable when they arrive for release.
- Timing parasite release in the spring is critical to successful fly management. Parasite release should start when stable flies are noticed bothering livestock.
- Release the right number of parasites. Reliable suppliers should provide a formula or guidelines to calculate the number of wasps to use. The wasp number is based on the number of animals present, with 20 to 50 parasites per animal being released.

Internal parasites are also a major health concern for grazing animals. Animals that graze are being exposed to parasites and the likelihood of re-infection is greater than those animals kept in confinement. In barns, animals should be fed using feeders rather than directly from the ground to limit contamination as a result of contact to bedding or manure.

Pasture management strategies for internal parasite control include stocking density, use of multiple species, deferred grazing schedules and safe or clean pastures.

- Grazing management must be the primary method for sustainable control of internal parasites. If pastures are not overstocked, there may be little difficulty with internal parasites. When livestock are forced to graze close to the ground tends to increase the occurrence of ingesting the infective larval stage of the parasites.
- Maintaining a grazing forage height of 4 inches or more will lower the probability of parasite infection considerably. Livestock will avoid manure piles and the forage surrounding them which helps to avoid eating the larvae.

- Pasture recovery periods should be planned carefully. Longer rest periods are needed to avoid parasite contamination. At least 30 days of rest period should be planned; six months is more effective at ensuring larval death. One strategy is to combine a grazing period, rest period, and haying before subsequent grazing.
- Delays grazing of a pasture until parasite numbers have declined. Young winter or spring lambs should not graze infected pastures from March to May. Young stock, during their first year of grazing, is most susceptible to infection. Whenever possible, these animals should graze pasture that was not grazed by the same species in the previous year.
- The risk of infection can be lowered by delaying access to pasture until the dew has lifted or grass has dried after a rain. Parasites stay closer to the plant base in dry conditions and are less likely to be ingested.
- Plant anti-parasitic forages such as Birdsfoot Trefoil and Chicory.
- Sheep and goats share the same parasites and should not be co-grazed for parasite control.
- Cattle or horses do not share the same parasites as sheep or goats and can be co-grazed or alternately grazed on the same pastures.
- Incorporate an annual pasture into the grazing system and drag the stubble before planting to perennial pasture.
- Put goats in a browse area when hot humid conditions favor the rapid life cycle of internal parasites.
- Safe and/or Clean pastures should be part of the grazing acres. Safe pastures are ones that have been used for hay, silage or small grains. Safe pastures carry some parasite load but if managed properly provide a good way of controlling infection. Clean pasture can be a new seeding grazed for the first time or a pasture grazed the previous year by only a different livestock species that does not have common parasites, for example cattle grazed the year before sheep.
- Graze young stock away from their mothers on pastures with low parasite levels.

### **Monitor**

- Fecal egg counts to determine the level of internal parasite pasture contamination.
- FAMACHA examination of the lower eyelid of sheep and goats to determine degree of anemia caused by barber pole worms.
- Observe manure pats for the presence of dung beetles responsible for decomposition of the manure.
- Observe animal behavior. Animals may bunch up to avoid flies. They may kick feet or run about excessively to escape buzzing and striking flies. Watch for excessive licking or scraping that may indicate mange or mites.
- Inspect animals. Look for affected skin areas that have been scraped on animals, elevated skin areas along the spine on cattle, manure laden tags of wool on sheep, wounds in the mouths of horses and the vent area of poultry for dried blood.

## References

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