

Crop Profile for Dairy in West Virginia

Prepared: June 20, 1999

General Production Information



- West Virginia ranked 45th in milk and milk product production in the United States in 1996 (1).
- West Virginia contributed 0.17% to total U.S. milk production in 1997 (2).
- Milk cow inventory in West Virginia totaled 19,000 head, with milk production totaling 252 million pounds in 1997 (1).
- A total of 252 million pounds of milk was produced. A total of 3 million pounds of milk was used on farms (1).
- Milk cash receipts totaled \$37.8 million (1).
- Gross producer income, including home consumption, totaled \$38 million (1).

Production Regions

Milk cows production is mainly concentrated in the eastern region of the state. In 1997, Jefferson County took the lead in the number of milk cows (4,000), followed by Mason (2,400), Berkeley (2,200), Preston (1,800), Greenbrier (1,500), and Monroe counties (1,500). The above-mentioned counties carry more than 70% of the total milk cows in the state (1).

Cultural Practices

The main housing options for dairy cows and their replacements are freestall barns, tie stall barns, loose housing or bedded-pack barns, outside corrals or feedlots, and pasture. Housing facilities for young stock should include a clean, dry maternity area for birth, a hutch or pen, and a weaning pen or super hutch which can hold 3-5 calves. A proper ventilation system is necessary in the barns to continuously exchange air. A proper manure handling and storage system must be coordinated with cow numbers,

cropland acres, crop nutrient needs, and weather (3).

Insect Pests

Flies (house, stable, horn, and face), cattle grubs, lice, and mange mites are the principle pests of dairy cattle in the state. Other pests include ticks, mosquitoes, and horse and deer flies.

House flies (*Mucosa domestica*)

- **Damage:** House flies irritate dairy cattle, assist in transmitting diseases and parasites, and may increase bacterial counts in milk (4).
- **Life cycle:** House flies breed in animal droppings and other organic matters. Each female lays 150-200 eggs in patches at three-to four-day intervals. It takes about 10 days to complete a life cycle, from egg to adult (5).

Stable flies (*Stomoxys calcitrans*)

- **Damage:** Stable flies attack animals legs and bellies, and feed on blood several times a day. They cause painful biting, animal fatigue, weight loss, and 40-60 percent reduction in milk (5 and 7).
- **Life cycle:** Stable flies breed in wet straw, manure, and other decaying vegetation. A female lays about 200-400 eggs during her lifetime (3-4 weeks). It takes about 3 weeks to complete a life cycle (5).
- **Chemical Control:** In 1997, West Virginia farmers reported using the following pesticides to control dairy cattle flies on pasture and in the barn (6, 7, and 8).

Insect Treatment for Cattle on Pasture

- **Malathion 5%:** Used by 40% of state dairy farmers. Applied as a dust to animals at least 5 hours before milking at a rate of 3 tbsps./ animal. Provides good control of horn fly.
- **Permethrin (Permethrin II) 11% EL:** Used by 5% of state dairy farmers. Thoroughly sprayed with a mix of 1 qt. 11% EL in 200 gal. water.
- **Permethrin (Atroban) 11% EC:** Used by 3% of state dairy farmers. Applied to animals as spray with a mix of 1 pt. 11% EC to 25 gal. water.

- **Permethrin (Ectiban) 5.7% EC:** Used by 1% of state farmers. Animals are spot treated with a mix of 1 qt. 5.7% EC to 2.5 gal. water.
- **Ciodrin 14.4% EC:** Used by 1% of state farmers. Applied to animals with a calibrated sprayer in a mix of 1 gal. 14.4% EC to 12 gal. water.
- **Vapona (Dichlorvos) 23.4% EC:** Used by 1% of state farmers. Applied as a mist to most body parts of the animal, particularly the legs and forehead, in a mix of 1 qt. 23.4% EC to 6 gal. water.
- **Methoxychlor (Marlate) 50% WP:** Used by 1% of state farmers. Applied as a dust at a rate of 1 rounded tbsp./animal.
- *** Coumaphos (Co-Ral) 5.8% EC, and 11.6% EC:** Used by 3% of state farmers. Applied as backrubber or self-oiler in a mix of 4 qt. 5.8% or 2 qt. 11.6% in 13 gal. of mineral, No.2 fuel or diesel oil.
- **Ectrin:** Used by 7% of state farmers. Applied with the Allflex tagging system at first appearance of flies in spring (2 ear tags/head). Other types of ear tags used by state farmers include pesticides such as Atroban, Permethrin, and Ectiban.
- **Rabon Oral Larvicide 97.3%:** Used by 3% of state farmers. Given as a feed additive in concentrates, or protein and mineral supplements at 70 mg. /100 lbs. body weight.

* Restricted use

Insect Treatment for Cattle in the Barn

The following pesticides were applied as a space spray with a mist blower and/or fogger for fly control in the barn (6).

- **Permethrin (Permethrin):** Used by 16% of state farmers.
- **Pyrethrin+synergist (Pyrethrin):**Used by 9% of state farmers.
- **Vapona (Dichlorvos):**Used by 6% of state farmers.
- **Permethrin (Ectiban):**Used by 4% of state farmers.
- **Permethrin (Atroban):**Used by 1% of state farmers.

- **Ciovap:** Used by 1% of state farmers.

Insect Control Baits in the Barn

- **Methomyl (Apache):**Used by 21% of state farmers.
- **Mehtomyl (Golden Marlin):**Used by 3% of state farmers.

Insect Treatment in the Milk Room

- **Pyrethrin+synergist (Pyrethrin):**Used by 29% of state farmers.
- **Alternatives:** A non-restricted use of coumaphos (Co-Ral, Zipcide) 1%, is an alternative pesticide to the aforementioned restricted-use coumaphos, and is applied as a dust. Use a combination of formulations such as baits, residual sprays, larvicides, or barn atomizers. Treatment alternations help in reducing the build up of pesticide resistance.
- **Cultural Control Practices:** Sanitation is the key to fly control. Proper drainage in barnyards, spreading manure thinly outdoors to kill fly eggs and larvae, and sticky tapes, paper, and ribbons are effective in managing small to moderate fly populations.
- **Biological Controls:** There are several parasitic wasps that can take a heavy toll on fly (house and stable) populations. The most adapted parasite to dairy cattle in the northeast is (*Muscidifurax raptor*). It attacks fly pupa inside and outside the barn. Beetles and mites are other natural enemies of fly eggs and larvae (9).

Horn flies (*Haematobia irritans*)

- **Damage:** Horn flies cause painful bites, interfere with the animal's feeding and resting, and can cause blood loss, reduced weight gain, and reduced milk production.
- **Life cycle:** Eggs are deposited in fresh cattle droppings. Maggots hatch in a day, feed on the dung for 3-5 days, pupate in the soil for five days, and then emerge as adults. They complete their life cycle in 10-20 days (7).
- **Chemical Control:** See house fly.

Face flies (*Musca autumnalis*)

- **Damage:** Face flies cause extreme annoyance to cattle on pasture all summer. They also may serve as vectors of eye diseases and parasites such as pinkeye and eye worms (5 and 7).
- **Life cycle:** Females lay eggs in fresh cattle droppings. Maggots develop on cow manure, then pupate in the soil. The entire life cycle takes about 2-3 weeks. In the fall, face flies enter buildings to hibernate (5 and 7).
- **Chemical Control:** See house fly.
- **Cultural Control Practices:** Since horn and face flies breed in fresh droppings on pasture, normal cultural fly measures will not significantly impact them.
- **Biological Controls:** Limited to beneficial organisms such as parasitic nematodes and wasps, predaceous mites, and dung beetles (9).

Cattle grubs, common (*Hypoderma lineatum*), and Northern (*H. Bovis*)

- **Damage:** Cattle grubs damage the animal's tissues, further reducing the carcass's value . They affect the animal's ability to graze efficiently, reduce weight gain, and delay first lactation.
- **Life cycle:** The cattle grub females attach their eggs (about 600) to the hairs of the cow's legs and lower body regions. Larvae emerge after 4-7 days and burrow into the skin, cause considerable irritation, and then migrate through the animal's connective tissues. During winter, grubs migrate again, this time into the animal's back where they form a warble (swelling) between the hide layers. After two months, the grubs emerge, drop to the ground, and pupate in pasture litter and soil for 2-8 weeks before adult flies emerge.
- **Chemical Control:** No pesticides are currently registered for control of cattle grubs on lactating dairy cattle.
- **Alternatives:** Participate in an area-wide program for treating all **non-lactating** cattle with systemic pesticide to reduce fly activity the following year.
- **Cultural Control Practices:** Proper timing for **non-lactating** cattle treatment (after adult fly activity ceases and before the migrating grubs reach the esophagus or spinal cord).

Lice, Chewing (*Bovicola bovis*), Sucking (*Linognathus vituli*), (*Haematopinus eurysternus*), and (*Solenopotes capillatus*).

- **Damage:** All types of lice cause extreme annoyance, decline in milk production, hair loss, reduced feed conversion efficiency, and general unthriftiness.
- **Life cycle:** Females attach their eggs to animal's hair with glue. Nymphs (young lice) emerge after 10 to 14 days, complete their development in few weeks, and spend their entire lives on the host animal.
- **Chemical Control:** The following pesticides have been reported to be used as sprays or pour-ons for louse or mite control on dairy cattle in West Virginia (6).

- **Permethrin (Ectiban):** Used by 6% of state farmers.
 - **Permethrin (Permethrin):**Used by 6% of state farmers.
 - **Permethrin (Atroban):**Used by 3% of state farmers.
 - **Pyrethrin (Pyrenone):**Used by 3% of state farmers.
 - **Dichlorvos (Vapona):**Used by 1.5% of state farmers.
 - **Coumaphos (Co-Ral):**Used by 1.5% of state farmers.
 - **Ciodrin:**Used by 1.5% of state farmers.
- **Cultural Control Practices:** Replacement animals should be isolated and carefully inspected for lice before being allowed to mingle with the herd. Housing calves in hutches will reduce infestations by 90% without any pesticide treatments.

Mange mites, Chorioptic (*Chorioptes bovis*) and Sarcoptic (*Sarcoptes scabiei*)

- **Damage:** Mange mites cause dermatitis, hair loss, scabbiness, and milk production decline.
- **Life cycle:** In late fall, development from eggs to adult mites takes about 2 weeks.
- **Chemical Control:** See lice.
- **Cultural Control Practices:** Be cautious when buying or introducing new animals. Inspect for visible skin that appear to be abnormally itchy or agitated. Segregate all newly purchased animals from the rest of the herd for several weeks and keep them under observation (9).

Critically-Needed Pesticides

The following pesticides were reported as critically needed for dairy insect/mite control:

- Malathion 5% and permethrin (Permethrin II) 11% EL: For insect treatment on barn animals.
- Methoxychlor (Marlate) 50% WP and coumaphos (Co-Ral) 5.8% EC, and 11.6% EC: For fly treatment for animals on pasture.

Contacts

This profile was sent to Extension personnel for review. Special thanks are extended to:

Wallbrown, R., Extension Agent, Mason County, West Virginia

Yohn, C., Extension Agent, Jefferson County, West Virginia

Survey questionnaires were sent to 422 dairy operators in West Virginia. Completed survey responses were received from 120 dairy operators. Results were summarized and prepared by West Virginia Pesticide Impact Assessment Program personnel as Extension Service publication entitled "Pesticide Usage for Dairy Cattle Production Systems in West Virginia".

Authors:

John F. Baniecki, Ph.D.

State Liaison Representative (Coordinator),
National Agricultural Pesticide Impact
Assessment Program (NAPIAP);
Extension Specialist, Entomology/Plant Pathology
West Virginia University
414 Brooks Hall
Morgantown, WV 26506
Ph.# (304)293-3911
Fax (304)293-2872
E-mail: jbanieck@wvu.edu

M. Essam Dabaan, Ph.D.

Program Specialist,
National Agricultural Pesticide Impact
Assessment Program (NAPIAP)
West Virginia University
414 Brooks Hall
Morgantown, WV 26506
Ph.# (304)293-3911
Fax (304)293-2872
E-mail: mdabaan@wvu.edu

References

1. Abbe, D. and S.R. Edwards. 1997. West Virginia Agricultural Statistics, Bulletin #28. National Agricultural Statistics Service.
2. USDA-NASS. 1998. Agricultural Statistics. National Agricultural Statistics Service.
3. Adams, R.S., et.al. 1995. Dairy Reference Manual, 3rd Edition. pp.293. Pennsylvania State University.

4. Watson, D.W., J.K. Waldron, and D.A. Rutz. 1994. Integrated Management of Flies in and around Dairy and Livestock Barns. Cornell University Cooperative Extension Service.
5. Rutz, D.A. Pest Management Recommendations for Dairy Cattle. Cornell University and Penn State University Cooperative Extension Services.
6. Baniecki, J.F., and M. E. Dabaan. 1998. Pesticide Usage for Dairy Cattle Production Systems in West Virginia. West Virginia University, Cooperative Extension Service.
7. Collison, C.H. 1978. Controlling Insects and Mites on Dairy and Beef Cattle. Penn State University, Cooperative Extension Service.
8. Lyon, W.F. 1995. Livestock and Livestock Building Pest Management. Ohio State University, Cooperative Extension Service, Bulletin #473.
9. Cornell University Internet Web site, 1997. Data from livrecommends-lib.

Database and web development by the [NSF Center for Integrated Pest Management](#) located at North Carolina State University. All materials may be used freely with credit to the USDA.