Crop Profile for Beef Cattle Production in South Dakota

Prepared: August 2002

General Production Information

- The beef cattle industry ranks as the leading agricultural industry in South Dakota in terms of total cash receipts, producing 29.9% of the total agricultural cash receipts for the state during 1999. This is above the five year average of 27.0% of the total state cash agricultural receipts.
- The average price received per 100 pounds was $108 for calves and $75.50 for cows during the 2000 season. This was the highest price received in the last five years.
- Cash receipts from the sale of cattle and calves totaled $1,410,608,000 during 2000. In addition, there was $10,754,000 value in home consumption of beef during 2000, with total gross income from cattle and calves measuring $1,421,362,000.
- South Dakota ranked 19th in the nation in terms of total cash receipts from livestock and livestock products during 1999, the last year for which reports are available.
- During 2001, South Dakota ranked seventh in the nation in numbers of all cattle and calves, with 4,050,000 head on producer's farms on January 1. This number is up four percent from the 2000 level totals approximately 4.2% of the total U. S. cattle inventory.
- South Dakota ranked fifth in the U.S. in beef cows that have calved, with 1,809,000 head on hand as of Jan.1, 2001. This is up 5% from 2000 and represents 5.4% of the total U.S. cattle inventory.
- South Dakota ranked fourth, behind Texas, Missouri and California in total calf crop on January 1, 2001, with 1,850,000 head being produced.
- South Dakota ranks as the eighth leading producer of cattle on feed for all feedlots, with 365,000 head on feed. This is an increase of 15,000 head over 2000 numbers.
- Beef replacement heifers over 500 lb were at 310,000 on January 1, 2001, up 30,000 head from 2000 levels.
- Steers over 500 lbs, with 780,000 head on hand on January 1, 2001, represented a large increase over the 2000 level of 710,000 head.
- Bulls over 500 lbs also increased in numbers during 2000, increasing from 95,000 on January 1, 2000 to 100,000 on January 1, 2001.
- Approximately 17,000 farms raised beef cattle during 2000. This represents a slight decrease in farms with beef cattle as compared to 2000 levels, but equals the five year average. Slightly greater than 52% of all farms maintain a beef cattle production enterprise.
- The largest percentage of the beef cattle farms in the state (50%) maintain herds of between 100 and 499 head, with 20% of the beef cattle farms running greater than 1000 head.

The Crop Profile/PMSP database, including this document, is supported by USDA NIFA.

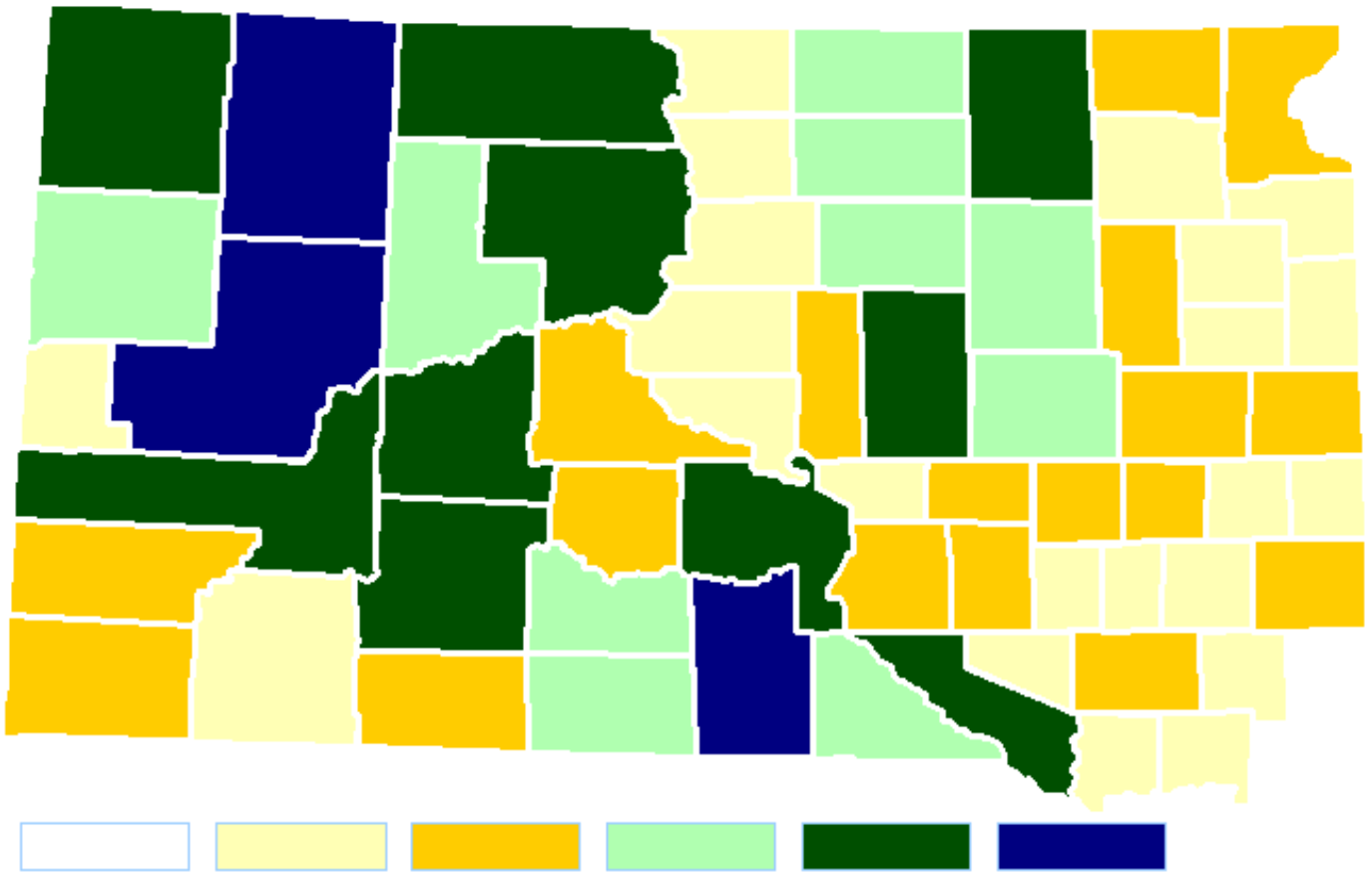

Figure 1. Beef Cattle Inventory, January 1, 2001. Numbers were derived from South Dakota Agricultural Statistics annual summary report. Leading production counties were Meade County in West Central South Dakota, with 81,000 head on hand, Perkins County in the Northwest reporting district, with 60,000 head on hand and Tripp county in the South Central District, with 52,000 head.

Cultural Practices

The beef cattle industry in South Dakota represents the single largest source of agricultural income for producers,

generating between 25 and 30% of the total gross agricultural receipts for each of the past five years. Annually, greater than $1.4 billion is received from the sales of cattle and calves in the state. The states beef cattle industry is somewhat geographically defined. The western half of the state consists of significant amounts of rangeland and cropping systems that include winter and spring wheat, fallow, other grain crops, grass hay and alfalfa. The beef industry in this area is comprised mostly of cow/calf operations with calves raised on grassland with some supplemental feeding in the winter months. As you move toward the central and eastern areas of the state, feed and forage crops such as corn become more plentiful and cropland agriculture is more intensive. The beef industry in these areas consists of some cow/calf operations on native grassland, cow/calf operations on improved grass pasture and dry lot operations. Stocker and backgrounding operations with calves being shipped out of state for finishing are also common in the central and east and finishing feedlots are also present throughout the area.

Cow/calf operators generally run their calves with the cow (dam) until the calf is weaned. Calving takes place primarily in the late winter and early spring, with calves being weaned in the fall of the year. Calves are then either sold or backgrounded through the winter and sold or pasture raised in the spring. Stocker and backgrounding operations either raise young heifers to be used replacement heifers or raise steers and heifers for the feedlot operations and eventual slaughter.

Pest management practices vary somewhat depending on the size of the cattle operation and the intensity at which the animals are handled. Insect control, especially fly control is a more major concern in dry lot and feedlot operations than it is for those operators with primarily grass pasture or native rangeland. Insect pests, however, cause significant economic loss each year through decreased vigor due to direct blood loss, irritation and annoyance of the livestock herd and also through potential spread of infectious diseases.

Pest management in the beef cattle industry takes many forms. Cultural practices such as feedlot scraping, pasturing cattle, etc. for the purpose of manure management is the most common non-pesticide method of insect control used in the state, with nearly 60% of producers identifying these as primary practices used. Other non-pesticide insect management practices identified in a survey of beef producers include: fly traps in and around buildings (11.63%), electrified screens (bug zappers) (5.12%), biological control of insects (2.79%) and burning pastures (1.40%) (Ruden, 1995). By far, the most common practice used by producers to combat insect pests (both external pest and internal parasites) is pesticide applications. A recent regional beef cattle pesticide use survey indicated that only approximately 6.5% of the total beef cattle numbers in the North Central states surveyed received no pesticide treatments..

Insect Pests

Insect pests are a continual concern for all cattle producers, and severe insect problems can have significant detrimental effects on maternal health of gestating cows, can affect maternal milk production and can reduce gains in feedlot cattle. During summer months, flies are the greatest concern for beef cattle producers. During the winter, mites, lice and grubs become a problem. A survey by the South Dakota Project of the North Central Pest Management Center several years ago showed the following pests to be the most commonly reported insect problems in beef cattle production. Results of

a regional study conducted by the Illinois Pest Management Center are also included for comparison.

Pests Reported as Problems on Beef Cattle, South Dakota and Regional

Pest	Regional Survey	South Dakota Data
Lice	67.3	20.7
Horn Fly	31.1	6.6
Flies	13.8	20.7
Screwworm (Black blowfly)	11.4	0
Ticks	10.5	0
Housefly	9.6	5.6
Mange	9.6	0
Stable Fly	9.0	0.8
Horse Fly	8.3	0*
Worms (Internal parasites)	6.2	6.6
Deer Fly	6.1	0*
Grubs/Heel Fly	4.7	6.8
Other	7.1	4.4

* Not Reported. The South Dakota survey did not specifically ask producers to differentiate the species of flies. It is felt that a portion of the general "Flies" category does include significant numbers of the biting flies (Horse and Deer flies).

Insect Pest Biology

Pasture Flies

Horn and face flies will not enter buildings or sheds in search of cattle, though they can remain on them when the cattle come indoors from the pasture. Attacks from these flies can be reduced by keeping cattle indoors, if this is an option.

Horn flies (*Haematobia irritans*)

Horn flies are blood feeding flies normally rest on the shoulders, back, neck, and head of cattle, though in the heat of the day, they often move to the belly. They reproduce in the fresh cattle manure and are present from early spring through fall. Cattle can withstand as many as 100-200 horn flies at any given time, but their presence in larger numbers may lead to reduced weight gain due to nervousness and losses in other areas such as milk production. Horn flies are a biting fly, causing irritation and nervousness if numbers are significant. Horn flies are a very serious pest nationally, and can cause significant economic damage.

Face flies (*Musca autumnalis*)

Female face flies sit on the face and feed on secretions from the eyes, nose, and mouth of cattle. They may carry pinkeye, although pinkeye outbreaks can also occur in the absence of face flies due to other vectors. Therefore, controlling face flies does not guarantee an absence of pinkeye. There are no estimates of how many face flies cause a reduction in the rates of production or growth. These flies are present in spring through autumn months.

Feedlot/Facility Flies

House Flies *(Musca domestica)*

House flies do not directly feed on the cattle, as they cannot bite. The house fly is, however, a pest of livestock, as they are quite annoying to livestock by their presence. They feed on feedstuffs, manure and other material in and around the cattle. They can spread disease by their feeding habits and by transmitting disease agents from manure to feed.

Stable Flies (*Stomoxys calcitrans*)

Stable flies are persistent pests of cattle and have been found more than 100 miles from their hatching site. They have a long, bayonet-like proboscis that causes a painful sting. As few as five stable flies on the legs of cattle has been shown to reduce cattle performance. Since they usually choose to feed on the front legs of cattle, cows will often stand in circles with shoulders touching to deter stable fly attacks. They are a major problem in the summer for confined cattle (feedlots, for example). Deterring attacks from stable flies is difficult since they live in and will readily enter buildings. Chemical sprays directed at the animals' legs may slow attacks but will not provide long-term control, especially in wet years when vegetation "washes" the pesticide off. Manure management and good sanitation are the best weapons against stable flies.

Other Biting Flies

Horse flies (*Tabanus* spp.)

Deer flies (*Chrysops* spp., *Haematopota* spp., *Silvius* spp., *Pangonia* spp.)

Biting flies severely annoy cattle and can reduce the rate of weight gain. Control is difficult since the female fly lands on an animal, slashes the skin, takes a blood meal, and flies away to rest. This can be repeated up to ten times before the female fly is satiated and leaves. Placing cattle in barns or sheds will keep horse and deer flies away since neither will enter buildings, but this is not a viable option in the rangeland and pasture areas. It is possible to deter the feeding female with applications of permethrin, but this is a short-term control method. There are no satisfactory long-term chemical controls for horse or deer flies.

Other Insect Pests

Cattle Grubs /Heel flies (*Hypoderma lineatum*)

These flies are not as common in South Dakota, but can be damaging. Animal tolerance for them is low. The mere presence of these flies upsets cattle, which reduces feeding, and animals sometimes injure themselves trying to avoid them. Adult flies lay eggs on hairs of animals in areas where it is difficult for the animal to dislodge them, such as the hocks of the hind legs or the front, ventral area. After hatching, the larvae then burrow under the skin and the life cycle continues inside the animal. Damage to the skin and meat from the burrowing larvae occurs and animal vigor is reduced. Control of this insect at the wrong time of the year (winter months) can also cause concern, as the larvae, when killed within the animal, will cause damage from their presence. Pour-on insecticides for control of this insect should only be used as directed.

Cattle Lice- Lice Complex A (*Boricola* + *Linognathus* + *Solenopotes* + *Haematopinus* spp.)

Lice occur every year and affect cattle throughout the year, but are most commonly observed in the winter when cattle are housed or corralled together (the lice reproduction rate increases with the onset of cold weather). Low or moderate infestations do not have a significant effect on meat production -- most animals can withstand moderate populations of lice before suffering a decrease in weight gain. However, lice infested cattle are more susceptible to disease, particularly respiratory problems. High infestations on individual animals will reduce weight gain and may indicate sickness or internal parasites. Infestations of all lice in this complex are treated with the same insecticides, generally through pour-on products. Milk production of mature animals is also reduced when lice become severe.

Pesticides Used

Many different formulations of different active ingredients are available for use against lice, mites, internal parasites and flies. Commonly used formulations in South Dakota include topical pour-ons and sprays, slow-release ear tags, residual premise sprays, and knockdown aerosols. Some ingredients can also be added to feeds to inhibit larval development in cattle manure. Injectable products are also used to some extent. Pesticide formulations vary, with some formulations able to be applied to lactating cows, while others are limited to dry cow treatment. Other products are formulated specifically for premise or facility treatment.

Pesticide resistance is a significant concern for livestock producers. House flies developed resistance to DDT within the first five years of commercial use in the late 1940s, and this species is known to have developed resistance to most of the other compounds in commercial use, including the most recent pyrethroids. Resistance to pyrethroid insecticides in the state is present, but spotty, despite over fifty years of commercial use. The most recently developed class of compounds is the avermectins (ivermectin, doramectin, eprinomectin), which have a broad spectrum of activity against lice, mites and internal parasites. The most commonly applied pesticide products in the North Central states, according to a 1997 Regional Pesticide Use Survey from the Illinois NCPMC project (Pike, et al, 2000) included (data expressed in terms of percent of total animal treatments): ivermectin (34%), famphur (17%), doramectin (17%), permethrin (7.8%) and fenthion (6.8%). South Dakota estimates from the survey include: famphur (34%), doramectin (24%), ivermectin (21%), permethrin (9%) and coumaphos (5%).

There are several classes of beef cattle pesticides available for use in the state. A summary of the use of each of these classes of pesticides in the North Central States and South Dakota is listed in the following table (Pike, 2000).

Percent of Beef Cattle Treated by Pesticide Class

Pesticide Class	Percent of Animals Treated (Region)	Percent of Animals Treated (South Dakota)
Avermectins	55.6	47
Organophosphates	36.1	45
Pyrethroids	15.1	13
Benzimidazoles	2.7	0
Growth Regulators	1.4	1.0
Acetylcholine mimics	0.5	0
Other	8	9
No pesticide applications	6.5	0*

* Data not available.

Beef Cattle Pesticide Application Methods

Insecticide Impregnated Ear Tags

There are currently approximately 16 brand names of insecticide impregnated ear tags registered for use in beef cattle in South Dakota. The ear tags fall into three classes: pyrethroid tags, organophosphate tags, and combination tags containing a mixture of organophosphate and pyrethroids in the tag. These tags are designed to give a controlled release of the

active ingredient over a period of time once attached to the cattle ear. It is important for cattle producers to manage ear tag use effectively. Insect resistance to pyrethroid insecticides has been well documented. To maintain effectiveness of ear tags, it is important for producers to rotate between a pyrethroid tag and an organophosphate tag. Combination tags containing an organophosphate and a pyrethroid in a single tag are available and are used by many producers. From a resistance management standpoint, however, this practice is not recommended. Exposure to both classes of insecticide at the same time may lead to cross resistance in the insect population that is not manageable with current ear tags.

Insecticide treated ear tags are effective against horn flies and face flies, and were at one time commonly used to control these pests. In recent years, the use of insecticide impregnated ear tags in the state has declined significantly. Pour-on products have replaced much of the ear tag use. Ear tags are still used in the state, however, and remain an important option for producers.

Oral Larvicide

These pesticide products are added to the mineral or feed for the cattle and provide control of insect larvae that develop in the manure. The control provided by these products generally is more effective in feedlot situations, where consumption of the products through the feed for the herd can be controlled. Oral larvicides are effective against larvae of horn and face flies. Stable and house flies are also controlled if the larvae of the flies are present in the manure.

Livestock Sprays

If cattle can be effectively corralled into a small area, animal sprays can be effectively used to control horn flies and face flies. There are many products registered in the state, however, use of these products is much lower than the use of pour-on or spot-on products. Sprays are generally used at a rate of 1 gallon per cow and used only a few times per season. Products registered in the state are listed in the tables for each pest below.

Pour-On Products

Many products are formulated to be used as pour-on products. These are generally applied by dribbling the product down the top midline of the animal as the animal is held in a chute or passes through a narrow chute. The products are absorbed through the skin. These treatments are used one to several times per season, depending on product. A table of registered pour-on products for each pest is listed below.

Back Rubbers

A back rubber consists of a dispensing unit that is placed where the livestock can pass under the unit and the pesticide product, which is mixed with a dispersion agent, usually an oil of some type, is transferred to the animals back, neck or face. Back rubbers can be either free standing free-choice units or can be placed at an entrance to a common livestock area, such as a mineral feeder, so treatment is received as the animal passes by. A table of back rubber products is listed below.

Dust Bags

Dust bags work on the same principle as back rubbers. As the animal passes under the dust bag, the pesticide is transferred

to the animal. Dust bags are placed as either free choice or forced entry, in a manner similar to the back rubbers. A table of registered products is shown below.

Insect Pest Control

Horn Fly Control Measures

1. **Insecticide Ear Tags.** The tags listed in the table above are effective control measures and were at one time widely used, with nearly 30% of the total cow/calf numbers in the state receiving treatment each year, according to pesticide use surveys for SD Beef Cattle (Ruden, 1995). As mentioned above, use has declined in recent years.

Insecticide Ear Tags For South Dakota Beef Cattle

Insecticide Class	Active Ingredient	Percentage	Tag Weight (g)	Brand Name
Pyrethroid	Permethrin	10	9.5	New Z Permethrin, GardStar Plus
	Permethrin/ Piperonyl Butoxide	10/13	9.5	Atroban Extra
	Cyfluthrin	10	13.7	Cutter Gold
	Fenvalerate	8		Ectrin
	Beta Cyfluthrin/ Piperonyl Butoxide	8/20	14.2	Cylence Ultra
	Cyhalothrin/ Piperonyl Butoxide	10/13	9.5	Saber Extra
	Zeta-cypermethrin/ Piperonyl Butoxide	10/ 20	9.5	Python, ZetaGard
	Zeta-cypermethrin/ Piperonyl Butoxide	10/ 20	15.4	Python Magnum
Organophosphate	Diazinon	40	15	Cutter 1, Patriot
	Diazinon	21.4	15	Optimizer, BovaGard
	Diazinon/ Chlorpyrifos	30/ 10	15	Warrior, DiaPhos RX
	Diazinon/ Coumaphos	20/ 20		Howitzer
	Diazinon/ Piperonyl Butoxide	18/ 2		New Z Diazinon
	Ethion	36	15	Commando
	Fenthion/ Piperonyl Butoxide	20/ 15		Cutter Blue
	Pirimiphos-methyl	20	9.5	Dominator
Combination Tag	Cypermethrin/ Chlorpyrifos/ Piperonyl Butoxide	7/5/3.5	9.5	MaxCon
	Lambda cyhalothrin/ Pirimiphos-methyl	6.8/ 14		Double Barrel VP

2. **Oral Larvicide.** The oral larvicides in the table below can provide effective control under the correct conditions. Control

can be somewhat sporadic, mostly due to the differences in feed intake among animals in the herd.

Oral Larvicide for Horn Fly Control in South Dakota

Active ingredient	Brand Name	Use Rate	Slaughter Interval/ Notes
Methoprene	Altosid, Moorman's Hi- Mag, Moorman's IGR	Various- see label, available as mineral, pre-mix and mineral block	None
Tetrachlorvinphos	Various- usually have R.O.L. (Rabon Oral Larvicide) in brand name	Various- see label, available as mineral, pre-mix or mineral block	None

Spray- on Products for Horn Fly Control in South Dakota

Active ingredient	Brand Name	Use Rate (with water)	Number of applications	Slaughter Interval/ Notes
Coumaphos	Co-Ral	1 pt 11.6% EC/25 gal 1 pt 42% flowable/100 gal	As needed.	None. No calves less that 3 months.
Methoxychlor	Methoxychlor, Prentox 2lb 24%,KE Marlate 50%	2 gallons 2 EC/100 gal	One/ 3 weeks	None
Permethrin	Various, Gardstar 40% EC	1 qt 5.7% EC, 1 pt 11% EC/ 100 gallons, 4 fl oz 40% EC/25 gallons @ 1 qt/animal	One/ 2 weeks	None
Permethrin or Permethrin + Piperonyl Butoxide	Atroban, Expar, Permectrin	1% and 7.4% applied directly as sprays at low volume	One/ 2 weeks	None
Phosmet	Prolate, Del-Phos	2 qt 11.6%/100 gal	One/ 7-10 days	3 day. No calves less than 3 months
Tetrachlorvinphos/ Dichlorvos	Ravap	1 gal 28.3%/ 75 gal	One/ 10 days	None

Pour-on Products for Horn Fly Control in South Dakota

Active ingredient	Brand Name	Use Rate (with water)	Number of applications	Slaughter Interval/ Notes
Eprinomectin[1]	Eprinex	1 ml/ 22 lbs body weight	1/ season	None. No calves under 8 weeks.

Moxidectin[1]	Cydectin	1 ml/ 22 lbs body weight	1/ season	None. No calves under 8 weeks.
Ivermectin[1]	Ivomec	1 ml/ 22 lbs body weight	1/ season	48 d
Cyfluthrin 1%	Cylence	1ml/ 100 lb body weight	Once/ 3 weeks	None
Fenthion	Lysoff	1 pt 7.6% product to 1 gallon water, use 1 oz mix per 1200 lb body weight	Three times per season with 14 d interval	21 d- one treatment, 35 d- last treatment, No calves under 3 mo
Cyhalothrin	Saber	10 ml/animal if <600 lb, 15 ml/animal if over 600 lb	4 times per 6 months, 14 d interval	None
Permethrin EIL (10%)	Permectrin II	2 oz/gallon diesel or water, use 3/4 to 1 cup mix/animal	14 d interval	None
Permethrin or Permethrin & piperonyl butoxide	Various[2]	Various- for 5% mixes- 3 ml/100 lb weight, for 10% mixes- 1.5 ml/100 lb weight	14 d interval	None

1 The avermectins are designed as internal parasite controls and generally provide only very short term fly control.

2 Brand names include: Atroban, Boss, DeLice, Durasect, Durasect II, Expar, Ectiban, Permectrin and others.

Pesticide Products for Horn Fly Control Through Back Rubbers

Active ingredient	Brand Name	Use Rate	Slaughter Interval/ Notes
Coumaphos	Co-Ral	1 gallon 11.6%/ 13 gallons diesel fuel	None
Methoxychlor	Methoxychlor	1 gal 2EC/ 5 gal light fuel oil	None
Permethrin	Various[1]	1 qt 5.7%, 1 pt 10 or 11%, 4 oz 40% EC/ 10 gallons diesel or oil	None
Phosmet	Del-Phos, Prolate	1 pt 11.7% product/ 6.25 gallons oil	None
Tetrachlorvinphos/Dichlorvos	Ravap	1 qt 28.3% EC/ 6 gallons diesel	None

1 Product brand names include: Atroban, Ectiban, GardStar, Insectiban, Permectrin, others.

Pesticide Products for Horn Fly Control Through Dust Bags

Active ingredient	Brand Name	Use Rate	Slaughter Interval/ Notes

Coumaphos	Co-Ral, Various	1% Dust	None
Permethrin	Ectiban, Insectrin, Permectrin	0.25% Dust	None
Tetrachlorvinphos	Rabon, Various	3% Dust, 1% Dust	None
Zeta-Cypermethrin & Piperonyl butoxide	Python Dust	0.225% dust- 2 oz/animal	Not more often than once per three days

Face Fly Control Measures

1. **Insecticide Ear Tags.** The tags listed in the table above for Horn Flies provide good control of face flies as well as horn flies, however, generally two tags are required for adequate control.

2. **Oral Larvicide.** Control and suggestions similar to horn fly.

Spray- on Products for Face Fly Control in South Dakota

Active ingredient	Brand Name	Use Rate (with water)	Number of applications	Slaughter Interval/ Notes
Permethrin	Various[1]	1 qt 5.7% EC, 1 pt 11% EC/ 100 gallons, 4 ox 40%/25 gallons, all used at 1 qt mix/ animal	One/ 2 weeks	None
Tetrachlorvinphos/ Dichlorvos	Ravap	1 gal 28.7%/ 75 gallons	One/ 10 days	None
Dichlorvos	Vapona	5 oz 43.2%/ 2 gallons. Direct to face of animal.	Daily, as needed	1 day. No use on Brahman or Brahman cross

Pour-on Products for Face Fly Control in South Dakota

Active ingredient	Brand Name	Use Rate (with water)	Number of applications	Slaughter Interval/ Notes
Cyfluthrin	Cylence	1ml/ 100 lb body weight	Once/ 3 weeks	None
Lambda-cyhalothrin	Saber[1]	10 ml/animal if <600 lb, 15 ml/animal if over 600 lb	4 times per 6 months, 14 d interval	None
Permethrin	Various[2]	Various- for 5% mixes- 3 mi/100 lb weight	14 d interval	None

1 Provides minimal control.

2 Brand names include: Atroban, DeLice, Durasect, Expar, Ectiban, Permectrin and others.

Pesticide Products for Face Fly Control Through Back Rubbers

Active ingredient	Brand Name	Use Rate	Slaughter Interval/ Notes
Coumaphos	Co-Ral	1 gallon 11.6%/ 13 gallons diesel fuel	None
Permethrin	Various[1]	1 qt 5.7%, 1 pt 10 or 11%/ 10 gallons diesel	None
Tetrachlorvinphos/Dichlorvos	Ravap	1 qt 28.7% EC/ 6 gallons diesel	None

1 Product brand names include: Atroban, Ectiban, GardStar, Insectiban, Permectrin, others.

Pesticide Products for Face Fly Control Through Dust Bags

Active ingredient	Brand Name	Use Rate	Slaughter Interval/ Notes
Coumaphos	Co-Ral	1% Dust	None
Permethrin	Ectiban, Insectrin, Permectrin, Various	0.25% Dust	None
Tetrachlorvinphos	Rabon	3% Dust	None

House Fly and Stable Fly Control Measures

House flies and stable flies can become pests of concern in feedlot and dry lot situations. Sanitation and sound manure management can provide a good measure of control and are generally the primary method used to control pests around the feed yard. Insecticide treatments can be effective, if used properly.

Stable fly control is very difficult due to the fact that the flies generally attack only the legs of the cattle. Pesticide sprays containing permethrin are registered for use, but are generally not used due to difficulty in application. Also, control may be sporadic due to loss of the product as the animal walks through grass or into water.

Biological Control

Biological control of fly pupae by use of minute parasitic wasps has been a method tried by approximately 2.6% of South Dakota beef producers, according to a pesticide survey by the South Dakota NCPMC Project (Ruden, 1995). This method is best used along with sound manure management and site sanitation, and provides marginal control at best.

Oral Larvicide

Oral larvicides are effective against stable and house flies, provided the larvae are growing in the manure mat. Many house fly larvae develop in areas other than manure piles and thus will not be controlled. The products listed in the horn fly section are registered in the state.

Short-term and Residual Premise Treatments for Stable and House Fly Control

Active ingredient	Brand Name	Use Rate (with water)	Notes
Dichlorvos	Vapona	1 gal 40.2%/ 100 gallon	No slaughter interval
Naled	Dibrom 8 (62%), Dibrom Concentrate (87.4%), Trumpet (978%)	5 pt 62%/ 100 gallons at rate to apply 0.25 lb technical naled per acre	No slaughter interval
Cyfluthrin	Countdown	16 ml 24.3%/ 1 gallon	Covers 1000 ft^2
Diazinon	Diazinon	2 lb 50WP/ 25 gallons	Cover 750 ft^2. No animals in area for 4 hrs.
Dimethoate	Cygon 2E	1 gallon/ 25 gallons	Covers 1000 ft^2
Lambda-cyhalothrin	Grenade ER	6-12 ml/ gallon	No animals until dry
Methoxychlor	Marlate	4 lb/ 10 gallons	Covers 500 ft^2
Permethrin	Various	Various, usually a 1% solution. See label for rates.	No more than one application every 14 d.
Permethrin Synergized Pour On	Atroban, Expar	Mist spray on surfaces.	Covers 7300 ft^2 per gallon.
Tetrachlorvinphos/Dichlorvos	Ravap	1 gallon 28.3%/ 25 gallons	Covers 1000 ft^2

Fly Baits for House Fly Control

Active ingredient	Brand Name	Use Rate (with water)	Notes
Methomyl	Various[1]	See product label	Most contain fly attractant.

1 Products include: Blue Assassin, Blue Streak, Fatal Attraction, Fly Bait, Fly Bait Plus, Golden Malrin, Improved Golden Malrin and Stimukil.

Horse Fly and Deer Fly Control Measures

Horse flies and deer flies are blood-sucking flies and can be pests of concern due to the annoyance and reduced gains that result in beef cattle. Horse flies can be quite large and can inflict a painful bite on the animal. These pests, although present in the state, were not identified as significant pests in the beef cattle surveys in the state. Control is usually through back rubbers as described earlier for other fly species. Permethrin products are the product of choice. Permethrin sprays, such as Atroban, Ectiban, Expar, GardStar, or Permectrin II may also be used. Many permethrin pour-on products, such as Atroban, DeLice, Durasect, Expar, Ectiban, Boss, Brute, and Permectrin can also provide a level of control.

Heel Fly/ Cattle Grub Control Measures

Heel flies are serious pests that are controlled through the use of insecticides and several of the internal parasite products. Usually only one application of the products per year is used. Timing of this application is important, as mistiming the application in the presence of the larval stages of the heel fly, which are inside the animal, can cause significant health concerns for the animal. A large percentage of the cattle in the state receive a pour-on treatment for grub control each year.

Spray-on Products for Heel Fly/Cattle Grub Control in South Dakota[1]

Active ingredient	Brand Name	Use Rate (with water)	Slaughter Interval/ Notes
Coumaphos	Co-Ral	3 gallons 11.6% EIL/ 100 gallons	None

1 Use one gallon per animal and spray the hide until wet.

Pour-on Products for Heel Fly/ Cattle Grub Control in South Dakota

Active ingredient	Brand Name	Use Rate	Number of applications	Slaughter Interval/ Notes
Doramectin	Dectomax	1 ml/ 22 lbs body weight	1/season	45d. Do not use on veal calves.
Eprinomectin	Eprinex	1 ml/ 22 lbs body weight	1/season	None. No calves under 8 weeks.
Ivermectin	Ivomec	1 ml/ 22 lbs body weight	1/season	48 d
Moxidectin	Cydectin	1 ml/ 22 lbs body weight	1/season	None. Do not use on veal calves.
Famphur	Warbex	½ fl oz/100 lb body weight, max of 4 oz	1/season	35 d
Fenthion 20%	Spotton	8 ml-300-600 lb animal, 12 ml 600-900 lb animal	1/season	45 d

Fenthion 3%	Tiguvon	½ fl oz/ 100 lb body weight	1/season	35 d

Injected Products for Heel Fly/Cattle Grub Control in South Dakota

Active ingredient	Brand Name	Use Rate (with water)	Slaughter Interval/ Notes
Doramectin 1%	Dectomax	1 cc/ 110 lb body weight	35 d
Ivermectin 1%	Ivomec	1 cc/ 110 lb body weight	35 d

Cattle Lice Control Measures

Cattle lice are a damaging pests to cattle production. Some lice are blood-feeders, while others are chewing pests that inhabit the hide and hair of the animal. Significant damage to cattle facilities is sometimes noted, as lice infestations cause severe itching and the cattle will rub fence posts, feed bunks, etc. to relieve the itch caused by these small creatures. Infestations are generally the most severe in the winter months. Control is usually through pour-on or cattle spray pesticide products.

Spray-on Products for Lice Control in South Dakota

Active ingredient	Brand Name	Use Rate (With Water)	Slaughter Interval/ Notes
Amitraz	Taktic	1 qt 12.5% EC/ 100 gallons. Use 2 gallon mix /animal	None
Coumaphos	Co-Ral	2 qt 11.6%/100 gallons. Use 1 gallon per animal. Also available as 25% WP.	None. Do not use on calves under 3 months.
Methoxychlor	Methoxychlor	2 gal 2EC/ 100 gallons	None
Permethrin	Various[1]	Various- See label for rate	None
Permethrin EC	Atroban 42.5% EC, Gardstar 405 EC	1 pt/ 100 gallons	None. One application/ two weeks
Permethrin Synergized	Atroban, Expar, Permectrin, Ultra Boss	1% undiluted low volume spray	None. One application/ two weeks
Phosmet	Prolate, Lintox DelPhos	1 gal 11.6%/ 100 gallons 1 gal/ 150 Gallons	3 d, Do not use on calves under 3 mo
Tetrachlorvinphos/ Dichlorvos	Ravap	1 gal 28.7%/ 75 gallons	None

1 Astro, Atroban, DeLice, Boss, others.

Pour-On Products for Lice Control in South Dakota

Active ingredient	Brand Name	Use Rate	Number of applications	Slaughter Interval/ Notes
Doramectin[1]	Dectomax	1 ml/ 22 lbs body weight	1/season	45 d. Do not use on veal calves.
Eprinomectin	Eprinex	1 ml/ 22 lbs body weight	1/season	None. No calves under 8 weeks.
Ivermectin[1]	Ivomec	1 ml/ 22 lbs body weight	1/season	48 d
Moxidectin	Cydectin	1 ml/ 22 lbs body weight	1/season	None. Do not use on veal calves.
Famphur	Warbex	1 fl oz 13.2%/ 200 lb body weight, max of 4 oz	1/season or after 40d	35 d. 21d for freshening cows
Fenthion 20%	Spotton	8 ml (300-600 lb animal), 12 ml (600-900 lb animal)	1/season	45 d
Fenthion 3%	Tiguvon	½ fl oz/ 100 lb body weight	1/season	35 d
Lambda-cyhalothrin	Saber 1%	10 ml/animal less than 600 lb, 15 ml/animal greater than 600 lb	1/two weeks. No more than 4 trts/ 6 months	No veal calves. No dairy cattle.
Permethrin	Boss (5%), various	3 ml/100 lbs body weight. Max of 30 ml/animal, others various	1/two weeks	None
Permethrin & Piperonyl butoxide	Synergized DeLice (1% + 1%) Ultra Boss (5% + 5%)	½ fl oz/100lbs body weight, Max of 5 fl oz/ animal 3 ml/100 lbs body weight. Max of 30 ml/animal.	1/two weeks	None

1 Injectable formulations of Ivomec and Dectomax are registered for control of sucking lice, but not chewing lice. Rates are 1 cc/110 lbs body weight with a 35 day interval prior to slaughter.

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