

NORTH DAKOTA LIVESTOCK INSECTICIDE EAR TAG TRIALS — 1983

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This was the third season that livestock ear tag demonstrations for horn fly control were conducted in North Dakota. Previous published data (Kopp et al., 1982, 1983) evaluated controls by the use of fly counts on treated and untreated herds. This season we attempted to assess economic benefits by determining average daily weight gain of calves; this method has been used previously in other states (Lynch et al., 1982).

The objectives of these 1983 trials were to: 1) provide demonstration trials of this fly control technique to livestock producers in several different geographic locations in the state; 2) to demonstrate and evaluate the efficacy of fly control provided by various products available on the North Dakota market; 3) to investigate the economic benefits of fly control techniques; and 4) to evaluate insecticide ear tag retention through the season.

Methods and Materials

Livestock insecticide ear tag trials were conducted in six counties and on the Ft. Berthold Indian Reservation. Each trial was designed to evaluate products for horn fly control through the 1983 season. For each trial, fly numbers on the treated herd were compared to fly numbers on an untreated herd in a separate pasture.

Treatment effectiveness was determined by making weekly or biweekly fly counts on the cattle. In each trial, county agents made the fly counts throughout the season. Flies were counted on both treated and control herds on the same afternoon between 1:00 and 5:00 p.m. Flies were counted on one side of five animals in each herd, and numbers reported are the average number of flies per side of the five animals.

Bottineau County Trial: Anchor® Permethrin Insecticide Tags and Strips were applied to 28 head of Hereford-Angus cross cows belonging to Tim Semler of Willow City. Calves were not treated. J. W. Schroeder, Bottineau County Agent, applied the tags on May 14, 1983 and made fly counts until August 10, 1983. At that

time, counts were stopped because 90 percent of the Anchor® tags had been lost. The control herd for this study was in a separate pasture $\frac{3}{4}$ of a mile from the treated herd.

Burleigh County Trials: Several different trials were conducted by ElRoy Haadem, Burleigh County Agent. An insecticide ear tag retention trial was conducted on 143 head of cattle belonging to John Irvine, rural Bismarck. Anchor® Permethrin Strips were applied to 41 head, Y-TEX Gardstar® Tags were applied to 60 head, Atroban® Ear Tags were applied to 18 head, Ectiban® Tapes were applied to 11 animal's tails and another 13 were attached to existing ear tags. Fly counts were recorded during the season on this mixed treatment herd as well as on a control herd in a separate pasture 1 mile away.

A second aspect of the Burleigh County trials was to evaluate the effect of dam ear tagging on calf weight gain. Three herds were used in this aspect of the study. Calves and cows all bore identification tags and calves were weighed in May when the trials were initiated. One insecticide ear tag was applied to each cow in the treated herd. The remainder of the untreated cow-calf herds were pastured apart from treated herds through the 1983 fly season. At weaning time in October, calves were identified and weighed in both the tagged and control herds. Several brands of permethrin insecticide ear tags were used in each of these three calf weight gain trials. Fly counts were made throughout the season on both the control and treated herd for each trial to demonstrate fly pressure and percent fly control. Calf weight gain trials were conducted at the Jim Heisler farm and the Myron Rogstad farm, both of rural Bismarck, and at the Harold and Sanford Williams farm near Wing. The weight gain study involved 49 calves at the Heisler farm, 126 calves at the Rogstad farm and 181 calves at the Williams farm. Analyses of variance for unbalanced design were performed using the General Linear Models Procedure of Statistical Analysis System (SAS) since equal numbers of animals were not included in each combination of treatments. Weight gain per day (WGPD) was used as the dependent variable. WGPD gives the same analytical results as total weight gain when analyses are run separately on each herd, but corrects for differences in time periods between treatment and weaning weight (which were present between herds) when analyses were run over all

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herds. The original working weight at time of treatments may have differed among animals assigned to different treatment combinations; therefore, regression analyses were run to determine whether WGPD was related to starting weight. These analyses showed enough evidence of a relationship to warrant inclusion of starting weight as a covariable in the analysis. The means for any treatment or combinations of treatments were thus corrected for any effects that may have been due to the original weights.

Ft. Berthold Indian Reservation: Ectiban® Insecticide Tapes were applied to 89 head of cattle on the John Sitting Crow farm near New Town on the Ft. Berthold Reservation. Keith Soiseth, the reservation county agent, applied the tapes on May 4, 1983 and made fly counts throughout the summer. A single insecticide tape was applied to the tail of each cow; the calves were not treated. An untreated control herd was located about 4 miles from the treated herd.

Kidder County Trials: Two separate ear tag trials were conducted by Kevin Misek, Kidder County Agent. Fly counts were made throughout the season in these trials. On the Joe Birrenkot farm near Dawson, a herd of 25 cows was treated with Y-TEX® Gardstar tags on May 19, 1983. Fly counts were made on this herd and an untreated control herd 2 miles away on a separate pasture. A second trial using Anchor® Permethrin Strips was conducted on Roger Koester's farm, Steele. Thirty yearling heifers were tagged with Anchor® strips on May 26, 1983 and flies were counted on this herd and a control herd 2 miles away throughout the season.

Logan County Trials: Logan County Agent Roger Martin conducted two trials on the Wayne Lange farm near Napoleon. These involved two treatments and an untreated control. Three herds were maintained on separate pastures; the first herd was treated with Ectrin® Insecticide Ear Tags, the second herd was treated with the feed-through insecticide Rabon® Oral Larvicide and the third herd received no fly treatment during the summer. Ectrin® tags were applied to one ear per animal on 150 head of crossbred heifers on May 10, 1983. The second trial in this study used Rabon® Oral Larvicide (ROL) as a feed-through treatment for control of fly larvae in the manure. ROL 7.7 percent mix was combined with salt, Di Cal and soybean oil meal. This mixture was offered as a free choice supplement throughout the summer. The 36 head of crossbred heifers in this treatment were held on a separate pasture throughout the summer. The untreated control herd was located about 1½ miles from the ROL treated herd and 5 miles from the Ectrin® treated herd. Weekly fly counts were made on all three herds throughout the season.

McIntosh County Trials: Two trials using Ectrin® Insecticide Ear Tags were conducted in McIntosh County by William Klein, the county agent, on the Dennis Sheck farm near Ashley. In the first trial, 18 head of yearling Hereford heifers were treated with one tag per ear on June 4, 1983. A control herd was located ½ mile

from the treated animals and fly counts were made on both herds throughout the summer.

In the second trial, seven yearling bulls were treated with Ectrin® Insecticide Ear Tags on June 4, 1983 and pastured adjacent to six untreated yearling bulls. Fly counts were made from June 23 to September 16. On August 1, 1983, the treated and control group were pastured together and fly counts were continued on the treated and untreated animals.

A third trial using Atroban® Insecticide Ear Tags was conducted on the Marvin Schneider farm near Ashley. One hundred head of Hereford cows were treated on May 14, 1983 and fly counts were made throughout the summer. An untreated control herd was pastured about 1 mile from the treated herd.

McLean County Trial: Anchor® Permethrin insecticide strips were applied to 30 cows on the Pat Carpenter farm near Washburn in McLean County on June 6, 1983. Pat, the McLean County Agent, counted flies throughout the season on his treated herd and an untreated control herd in an adjacent pasture.

Results and Discussion

The horn fly, *Haematobia irritans* (L.), is the most uniformly distributed summer nuisance fly on pasture cattle in North Dakota. It is about ⅔ the size of the house fly and is dependent on the presence of grazing cattle throughout its life cycle. The adults are blood sucking flies that remain on cattle day and night. A single fly feeds 24-28 times per day, causing considerable annoyance to the host animal (Harris et al., 1974). There is some movement of individual flies from animal to animal, but these movements involve relatively short flights depending upon how bunched the cattle are in a pasture. Male flies search out receptive females on cattle and mate; female flies leave the cattle briefly to deposit their eggs in freshly dropped cattle dung. The eggs hatch in several hours and maggots develop in the dung. The mature larvae migrate to beneath or slightly to the side of the drying cow pat and change into pupae. Adult flies emerge from these pupae. Development from the freshly laid egg to the adult may take less than 10 days during warm periods of the summer. Horn fly populations peak during August and early September in North Dakota.

There are other nuisance flies present on North Dakota pastures. All pastures in this study had stable flies, *Stomoxys calcitrans* (L.), present and some pastures had low populations of face flies, *Musca autumnalis* De Geer. Stable flies and face flies, when present, were in very low numbers. These flies spend much less time on cattle compared to horn flies. Insecticide ear tags in 1983 effectively controlled horn flies and greatly reduced the number of flies observed on pastured animals.

In three separate trials in Burleigh County (Tables 1, 2 and 3), horn fly control was demonstrated with ear

Table 1. Permethrin ear tag fly counts on the John Irvine farm near Bismarck in Burleigh County, ND. One hundred and forty-three cows received 1 tag; calves were untagged. Brands used were Atroban®, Y-TEX®, Ectiban® and Anchor® and applied on May 14, 1983.

Date	Weeks After Treatment	Avg. # Flies/Side (5 Animals)		% Control
		Tagged	Untagged	
June 17	5	0	34	100
June 24	6	0	80	100
July 1	7	0	200	100
July 8	8	0	275	100
July 15	9	5	200	98.1
July 22	10	4	350	99.1
July 29	11	3	350	99.1
Aug. 5	12	5	250	98.0
Aug. 12	13	3	300	99.0
Aug. 19	14	2	200	99.0

Table 2. Permethrin ear tag fly counts on the Jim Heisler farm near Bismarck in Burleigh County, ND. Twenty-four cows received 1 tag; calves were untagged. Brands used were Anchor®, Ectiban® and Y-TEX® and applied on May 31, 1983.

Date	Weeks After treatment	Avg. # Flies/Side (5 Animals)		% Control
		Tagged	Untagged	
June 17	3	12	30	60.0
June 24	4	2	35	94.2
July 1	5	2	40	95.0
July 8	6	1	60	98.3
July 15	7	3	160	98.1
July 22	8	4	180	97.7
July 29	9	3	150	98.0
Aug. 5	10	3	180	98.3
Aug. 12	11	0	175	100
Aug. 19	12	3	180	98.3
Aug. 26	13	3	250	98.8
Sept. 2	14	15	200	92.5
Sept. 9	15	18	200	91.0

Table 3. Permethrin ear tag fly counts on the Sanford and Harold Williams farm near Wing in Burleigh County, ND. Seventy-three cows received 1 tag; calves were untagged. Brands used were Anchor®, Ectiban® and Y-TEX® and applied on June 9, 1983. Cattle were divided into two treated groups and an untreated control with each herd pastured separately.

Date	Weeks After Treatment	Avg. # Flies/Side (5 Animals)			% Control	
		Tagged		Untagged		
		Herd #1	Herd #2		Herd #1	Herd #2
June 28	3	2	2	70	97.1	97.1
July 5	4	0	4	100	100	96.0
July 13	5	3	0	130	97.6	100
July 20	6	4	4	190	97.8	97.8
July 27	7	8	8	190	95.8	95.8
Aug. 3	8	3	4	150	98.0	97.3
Aug. 10	9	3	3	200	98.5	98.5
Aug. 17	10	4	2	290	98.6	99.3
Aug. 24	11	5	5	200	99.0	99.0
Aug. 31	12	7	8	250	97.2	96.8

tags containing permethrin as the active ingredient. Anchor®, Ectiban® and Y-TEX® tags were mixed in the herds. This mixing of brands was designed to allow for the evaluation of tag retention. Horn fly populations peaked in late July on the Irvine farm as shown in Table

1 and in late August on the Heisler and Williams farms, Tables 2 and 3 respectively. Excellent horn fly control was demonstrated at all three Burleigh County locations with seasonal counts showing better than 95 percent fly control throughout the entire season.

The results of the Burleigh County tag retention studies are shown in Table 4. Of the four brands of ear tags and five application methods, the best retention was demonstrated by Atroban®. Ectiban® tapes applied to the tails were all lost in this trial. When Ectiban® tapes were applied to existing ear tags, only 12 percent were lost during the season.

Table 4. Ear tag retention trial on the John Irvine farm near Bismarck in Burleigh County, ND — 1983.

Brand	Number Tagged	% of Tags Lost
Atroban® Insecticide Tag	18	0
Ectiban® Tape On Ear Tag	13	12
Anchor® Permethrin Strip	41	49
Y-TEX® Gardstar	60	60
Ectiban® Tape on Tail	11	100

Ectrin® Insecticide Ear Tags were evaluated in trials in McIntosh and Logan Counties. Results of the two Ectrin® trials in McIntosh County are presented in Tables 5 and 6. The yearling heifer trial demonstrated excellent fly control through the 15th week (mid September) with 5 percent tag loss during the season. Table 6 shows the results of the yearling bull trial. The treated and control herd were held in separate but adjacent pastures until August 1, 1983. At that time both herds were turned in to the same pasture. Counts were continued on the tagged versus the untagged bulls through the remainder of the season. There was a dramatic decrease in fly numbers on the untagged bulls after they were pastured with treated bulls. As the season progressed, there was also an increase in the flies on tagged animals. By the end of the season, 10 percent of the Ectrin® tags were lost by the bulls.

Table 5. Ectrin® Insecticide Ear Tag: Hereford yearling heifer trial fly counts on the Dennis Scheck farm near Ashley in McIntosh County, ND. Tags were applied to 18 yearling heifers on June 4, 1983 with an untreated control herd about ½ mile away.

Date	Weeks After Treatment	Avg. # Flies/Side (5 Animals)		% Control
		Tagged	Untagged	
June 23	3	5	150	96.7
June 30	4	10	200	95.0
July 11	6	40	325	87.7
July 25	8	45	300	85.0
Aug. 5	9	35	450	92.3
Aug. 19	11	35	600	94.2
Aug. 31	13	30	550	94.6
Sept. 9	14	25	500	95.0
Sept. 16	15	15	425	96.5

Table 6. Ectrin® Insecticide Ear Tag: Hereford yearling bull trial fly counts on the Dennis Scheck farm near Ashley in McIntosh County, ND. Tags were applied to 7 yearling bulls on June 4, 1983 and control animals were held in an adjacent pasture until August 1, 1983, after which the treated and control animals were run together.

Date	Weeks After Treatment	Avg. # Flies/Side (5 Animals)		% Control
		Tagged	Untagged	
June 23	3	5	200	97.5
June 30	4	10	250	96.0
July 11	6	20	350	94.3
July 25	8	20	350	94.3
Aug. 5*	9	30	50	--
Aug. 19	11	40	50	--
Aug. 31	13	40	50	--
Sept. 9	14	50	70	--
Sept. 16	15	70	70	--

*On August 1, 1983, the control and treated animals were turned into the same pasture.

In Logan County, both Ectrin® Insecticide Ear Tags and Rabon® Oral Larvicide (ROL) were evaluated against an untreated control herd. Both insecticide treatments and the control herd were pastured separately. The results are shown in Table 7. Horn fly populations peaked in early September and both the ROL treatment and the Ectrin® tags provided excellent fly control. Five percent of the Ectrin® tags were lost by animals in this study.

Table 7. Rabon® Oral Larvicide Feed Through Insecticide (ROL) versus Ectrin® Insecticide Ear Tags: Heifer trial fly counts on the Wayne Lang farm near Napoleon in Logan County, ND. Thirty-six heifers had access to salt-mineral mix containing ROL from May 10, 1983 to the end of the study. On a separate pasture, 150 heifers received 1 Ectrin® Ear Tag per animal on May 10, 1983. An untreated control herd was located ¾ mile from the ROL treated herd and 5 miles from the Ectrin® treated herd.

Date	Weeks After Treatment	Avg. # Flies/Side (5 Animals)		% Control	
		ROL Treatment	Ectrin® Tagged	Untagged	Ectrin®
May 14	0	0	0	0	0
May 28	2	0	0	40	100
June 11	4	0	10	60	100
June 18	5	0	10	100	100
June 25	6	10	10	125	92.0
July 2	7	20	20	200	90.0
July 9	8	25	20	250	90.0
July 16	9	30	20	250	88.0
July 23	10	25	15	275	90.9
July 30	11	30	20	275	89.1
Aug. 6	12	20	15	300	93.3
Aug. 20	14	30	15	400	92.5
Aug. 30	16	35	10	450	92.2
Sept. 10	18	75	5	600	87.5

Atroban® Insecticide Ear Tags were used in a trial in McIntosh County on the Marvin Schneider farm and the results of this trial are shown in Table 8. The horn fly population peaked in late August and excellent fly control was demonstrated by these tags throughout the season. Five percent of the Atroban® tags were lost in this trial.

Table 8. Atroban® Insecticide Ear Tag: Hereford cow-calf trial fly counts on the Marvin Schneider farm near Ashley in McIntosh County, ND. Tags were applied to both cows and calves in a 100 head herd on May 14, 1983, and the untreated control herd was about 1 mile away.

Date	Weeks After Treatment	Avg. # Flies/Side (5 Animals)		% Control
		Tagged	Untagged	
June 23	3	10	175	94.3
June 30	4	15	200	92.5
July 11	6	20	225	91.2
July 25	8	20	275	92.8
Aug. 5	9	25	250	90.0
Aug. 19	11	20	450	95.6
Aug. 31	13	10	600	98.4
Sept. 9	14	15	500	97.0
Sept. 16	15	10	500	98.0

Ectiban® Insecticide Tapes were evaluated for horn fly control on the John Sitting Crow ranch on Ft. Berthold Indian Reservation. Results of this trial are shown in Table 9. The insecticide tapes were applied to the tail and 80 percent were lost by the 17th week of the study. In spite of heavy tape loss, excellent season long horn fly control was demonstrated.

Table 9. Ectiban® Insecticide Tape: Cow-calf trial fly counts on the John Sitting Crow farm near New Town on the Ft. Berthold Reservation, ND. A single insecticide tape was applied to the tails of 89 cows on May 4, 1983; calves were not tagged. An untreated control herd was about 4 miles away.

Date	Weeks After Treatment	Avg. # Flies/Side (5 Animals)		% Control
		Tagged	Untagged	
May 31	4	0	25	100
June 6	5	0	50	100
June 15	6	0	62	100
June 23	7	1	75	98.7
June 30	8	2	100	98.0
July 7	9	1	120	99.1
July 12	10	2	80	97.5
July 27	12	2	170	98.8
Aug. 4	13	6	140	95.7
Aug. 11	14	1	135	99.2
Aug. 18	15	5	145	96.6
Aug. 25	16	6	170	96.5
Sept. 1	17	12	197	93.9

Y-TEX® Gardstar Insecticide Ear Tags were used in trials in Burleigh and Kidder Counties. The results of the Burleigh County trial are shown in Table 10. Excellent fly control was demonstrated throughout the season. Tag loss was not evaluated in this trial.

The results of the Y-TEX® ear tag trial in Kidder County are shown in Table 11. Fly counts demonstrated 80-90 percent horn fly control for most of the season. There was no tag loss of Y-TEX® tags in this trial.

Table 10. Y-TEX® Gardstar Insecticide: Ear tag fly counts on the Myron Rogstad farm near Bismarck in Burleigh County, ND. Cows received 1 tag on May 20, 1983; calves were untagged.

Date	Weeks After Treatment	Avg. # Flies/Side (5 Animals)		% Control
		Tagged	Untagged	
June 7	3	0	24	100
June 24	5	2	80	97.5
July 1	6	0	200	100
July 8	7	1	275	99.6
July 15	8	5	200	97.5
July 22	9	4	250	98.4
July 29	10	6	280	97.8
Aug. 5	11	5	250	98.0
Aug. 12	12	5	300	98.3
Aug. 19	13	8	250	96.8
Aug. 26	14	7	350	98.0
Sept. 2	15	8	200	96.0
Sept. 9	16	6	190	95.2

Table 11. Y-TEX® Gardstar Insecticide Ear Tag: Cow-calf trial fly counts on the Joe Birrenkot farm near Dawson in Kidder County, ND. Twenty-five cows received 1 tag per ear on May 19, 1983; calves were not tagged. An untreated control herd was pastured 2 miles away.

Date	Weeks After Treatment	Avg. # Flies/Side (5 Animals)		% Control
		Tagged	Untagged	
June 10	3	1	20	95.0
June 17	4	3	29	89.6
July 8	7	8	56	72.4
July 15	8	15	125	88.0
July 29	10	21	230	90.9
Aug. 19	13	39	250	84.4
Aug. 26	14	40	250	84.0
Sept. 2	15	56	300	81.3

Anchor® Permethrin Strips and Tags were evaluated in Bottineau, Kidder and McLean Counties. The results of the Bottineau County trial are shown in Table 12. Fly control in this trial was erratic and the counts were discontinued after August 10, 1983 since by that date 90 percent of the tags had been lost.

Table 12. Anchor® Permethrin Strips and Ear Tags: Cow-calf trial fly counts on the Ted Semler farm near Willow City in Bottineau County, ND. Twenty-eight cows received 1 tag per animal on May 14, 1983; calves were not tagged. An untreated control herd was about ¾ mile away.

Date	Weeks After treatment	Avg. # Flies/Side (5 Animals)		% Control
		Tagged	Untagged	
June 18	5	12	50	76.0
June 28	7	5	95	94.7
July 6	8	6	20	70.0
July 14	9	7	80	91.2
July 23	10	12	55	78.2
July 30	11	15	100	85.0
Aug. 10*	13	35	75	53.3

*This trial was discontinued after August 10, 1983 since 90% of the tags had been lost by then.

In Kidder County, Anchor® strips were evaluated for horn fly control; these results are presented in Table 13. Percent control was between 80-90 percent for most of the season. Tag loss in this trial was 6.6 percent for the season.

Table 13. Anchor® Permethrin Strip: Angus yearling heifer fly counts on the Roger Koester farm near Steele in Kidder County, ND. Thirty heifers received 1 tag each on May 26, 1983. An untreated control herd was about 1 mile away.

Date	Weeks After Treatment	Avg. # Flies/Side (5 Animals)		% Control
		Tagged	Untagged	
May 26	0	4	4	0
June 10	2	0	18	100
June 24	4	3	38	92.1
July 1	5	5	46	89.1
July 8	6	9	51	82.4
July 22	8	13	118	89.0
July 29	9	17	150	88.7
Aug. 5	10	23	175	86.8
Aug. 12	11	31	175	82.3
Aug. 19	12	38	205	81.5
Sept. 2	13	50	260	80.8

In McLean County, Anchor® strips were evaluated for fly control and the results are shown in Table 14. Excellent fly control was demonstrated through the end of August, but heavy tag loss occurred in September. By the end of the trial, 40 percent of the Anchor® strips were lost.

Table 14. Anchor® Permethrin Strip: Cow trial fly counts on the Pat Carpentier farm near Washburn in McLean County, ND. Tags were applied to 30 cows on June 6, 1983 and an untreated control herd was in an adjacent pasture.

Date	Weeks After Treatment	Avg. # Flies/Side (5 Animals)		% Control
		Tagged	Untagged	
June 17	2	15	160	90.6
July 1	5	10	175	94.3
July 15	7	8	200	96.0
July 29	9	9	250	96.4
Aug. 9	11	25	300	91.7
Aug. 23	13	25	300	91.7
Aug. 30	14	25	275	90.9
Sept. 9*	15	75	250	70.0
Sept. 23	17	100	250	60.0
Sept. 30	18	150	250	40.0

*Tag loss began in early September and approximately 40% of the strips were lost by the trial's end.

Improved management techniques in a cow-calf herd should be reflected in increased calf weight gain. Average calf weight gain is used as a measure to evaluate many different management techniques. In Burleigh County, we used average calf weight gains to evaluate the management practice of using insecticide ear tags for fly control. The results of this evaluation on three Burleigh County farms are shown in Table 15. The

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average seasonal weight gain of the tagged calves showed a weight advantage that ranged from 10-17 pounds per calf on the different farms. The average seasonal cash value advantage per calf for tagged versus untagged herds ranged from \$6.20 to \$10.54 on the different farms.

Table 15. Burleigh County 1983 Calf Weight Gain Trials. Comparison of trials on 3 separate farms. Cows with 1 insecticide ear tag; calves untagged. The untreated control herd was pastured separately.

Farm	Season Gains ¹ (lbs.)		Advantage (lbs.)	Season Cash (\$) Value Advantage ²
	Tagged	Untagged		
JH	271 (5)	261 (5)	10	6.20
MR	248 (33)	231 (37)	17	10.54
SW	302 (10)	288 (9)	14	8.68

¹Average calf weight gain with the number of animals in parentheses.

²Estimated calf market value of \$62.00 cwt.

When separate analyses of variance were run for each farm (Table 15), the differences in weight gains between calves of tagged and untagged animals never quite reached the significance level ($P=0.05$). However, when the analysis was done over all herds and only on steer calves with starting weights as a covariate, significant differences ($P=0.05$) were indicated between the tagged and untagged animals. Based on the adjusted mean weight gains per day, the calves of insecticide ear tagged cows gained an average of 14.7 pounds more than untagged animals over a 150-day trial period. Treatment resulted in a \$9.11 value increase per calf over the untreated animals at a calf market price of \$62.00 cwt.

After subtracting the cost of the one insecticide ear tag applied per cow (ca. \$1.25) and the cost of application, there is still sufficient cash value gain to make insecticide ear tags profitable.

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 Ted Semler, Willow City, ND
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 Kevin Misk, Kidder County Agent
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 ICI Americas, Inc.

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