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1994 Pest Control Survey

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Kent D. Hall, Rodney L. Holloway, Clifford E. Hoelscher, and Joseph C. Paschal*

Agricultural and Environmental Safety
Texas Agricultural Extension Service
Texas A&M University
College Station, Texas 77843

*Extension Associate – Pesticide Assessment, Extension Specialist – Pesticide Assessment, Professor and Extension Specialist, Extension Specialist – Livestock, respectively, Texas Agricultural Extension Service, The Texas A&M University System.
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Beef cattle production is the number one agricultural enterprise in Texas. Estimated value of Texas beef was just under 5 billion dollars in 1994 (Bartek, 1995). Texas had 130,000 beef cow operations in 1993 with 5.57 million beef cows (TASS, 1994). These include cow/calf operations ranging in size from one cow to thousands of cows. Most cow/calf operations in Texas have fewer than 50 cows.

A large majority of the calves produced by cow/calf producers are grazed as stockers in Texas or other states or go directly to feedlots for fattening. Those weaned calves that go to stocker operations are grazed for a short period of time (a few months) before being transferred to a feedlot.

External cattle pests such as horn flies and cattle grubs and internal cattle pests such as stomach worms and liver flukes are a constant menace to cattle production. Cattle pests damage hides, reduce meat and milk production, transmit diseases, and cause energy loss (Hoelscher, 1994). The result is reduced income for cattle producers and lower consumer product quality. Cattle producers employ both non-chemical and chemical pest control methods to minimize economic loss from these pests. Non-chemical pest control methods include such practices as pasture rotation, prescribed pasture burning, isolating new animals from the herd, segregating infected animals, and keeping feeders and waterers sanitary.

A variety of chemical pest control products are available on the market to manage pests. There are many different methods for applying these products to the cattle. Sprays, dusts, pour-ons, and injection products are some of the methods used to apply chemical pest control products to cattle.

Pest problems and control methods change over time. Information on current pest problems and pest control practices is useful for producers, manufacturers, distributors of pest control products, researchers, Extension workers, and government agencies. The U.S. Environmental Protection Agency (EPA), for example, uses data on pest problems and pest control practices to evaluate the benefits of pesticides when making registration decisions.

A mail survey was conducted in 1994 to obtain information on pest problems and pest control practices of Texas cow/calf and stocker operators. Nine hundred fifty-one completed questionnaires were returned from a true sample of 2,131 questionnaires sent out (Hall, 1995). A 45 percent rate of return was achieved. Results of the survey are the subject of this report.

Survey Results

The respondents were asked to check a list of external pests and internal pests which they believed were a problem in their cattle operation. Pests were rated by the difficulty of control for each pest problem on a 1 to 4 scale (1 = not difficult to 4 = very difficult). Ninety-eight percent of the respondents checked at least one pest from the external list as being a problem in their cattle operation, and 75 percent checked at least one pest from the internal list.

External Pests

Horn flies were the most prevalent external pests. Eighty-six percent of the respondents who checked at least one external pest reported that horn flies were a problem in their cattle operation (Figure 1). Lice, mosquitoes, and cattle grubs were a problem for 62 percent, 51 percent, and 49 percent of those respondents, respectively. Horn flies, mosquitoes, stable flies, and house flies were ranked as the external pests most difficult to control with overall rankings of 2.6, 2.5, 2.4, and 2.4, respectively.

Internal Pests

Almost all (94 percent) of the respondents who checked at least one internal pest as a problem in their cattle operation checked stomach worms (Figure 2). Tape worms, coccidiosis, and cattle liver flukes were checked as a problem by 35 percent, 32 percent, and 30 percent of those respondents, respectively. Generally, internal pests were not perceived to be as difficult to control as external pests. There was also less variability in control difficulty with the internal pests than with the external pests. Producers may feel it is more difficult to assess internal pest control. The overall Difficulty to Control ranking for deer liver flukes was 2, while it was 1.9 for stomach worms and cattle liver flukes and 1.8 for tape worms and coccidiosis.

Seventy-seven percent of all the respondents answered a question about which two cattle pests they felt cause the greatest economic loss in their cattle operation. They listed a total of 28 different pests. The most common answers were horn flies (48 percent of those responding) and stomach worms (45 percent of those responding). Lice was the third most often listed pest, listed by 14 percent of those who answered the question.
Several different application methods were used to apply chemical pest control products. The most popular and easiest to use, pour-ons, were used by 68 percent of the respondents (Figure 4). Fifty-one percent reported using injectables, 47 percent sprays, 43 percent dusts, 39 percent ear tags, and 20 percent back rubbers. Less than 4 percent said they used dipping vats.

**Cow/Calf vs Stocker**

Comparisons were made to determine if there were differences in pests and pest control practices between cow/calf operations and stocker operations. Of the 951 respondents, 716 had cow/calf operations, 210 had combination cow/calf and stocker operations, and 19 had stocker operations. The type of operation was not given by the remaining 6 respondents. Responses from the 716 cow/calf operations were compared to those of the 19 stocker operations.

The responses of cow/calf operators and stocker operators were quite similar overall. Some of the significant differences, however, were that all stocker operators said that horn flies were a problem in their operation compared to 89 percent of cow/calf operators. Many stocker operations are in the eastern part of the state where horn fly populations are more severe. In contrast, horse flies were a problem for only 26 percent of the stocker operators, but 45 percent of cow/calf operators considered horse flies a problem. The Texas Rolling Plains and East Texas areas have more abundant horse flies.

Ninety-five percent of stocker operators treated all their cattle with some pest control product in 1994 compared to only 73 percent of the cow/calf operators. Twenty-one percent and 16 percent, respectively, of cow/calf operators. Fifty-seven percent of the cow/calf operators practiced pasture rotation for pest control but only 26 percent of stocker operators practiced pasture rotation. In terms of product forms, 16 percent of stocker operators used boluses and 74 percent used injectables to treat their cattle compared to 5 percent and 49 percent, respectively, of cow/calf operators. Eighty-seven percent of the cow/calf operators dewormed their cattle in 1994 compared to 100 percent of the stocker operators. Only 39 percent of the cow/calf operators used ear tags as opposed to 60 percent of the stocker operators. A single ear tag treatment provides 3 to 5 months of fly control. This period of control is very desirable for the stocker operator. In most instances the increased use of internal and external parasite control evidenced by the stocker operators indicates that these practices have an economic benefit to young growing cattle.

**High vs Low Weaning Weights**

To examine how pest problems and pest control practices might influence beef production, questionnaire responses of cow/calf producers with average weaning weights over 500 pounds were compared to those of cow/calf producers with average weaning weights of 500 pounds or less. In this report, producers with average weaning weights of over 500 pounds will be referred to as the Higher Weaning Weight (HW) group (326 respondents) and those with average weaning weights of 500 pounds or less will be referred to as the Lower Weaning Weight (LW) group (576 respondents).

Producers in the HW group were more likely to indicate that the various pests were a problem in their cattle operation than were producers in the LW group for all the pests (external and internal) except mos-

![External Pests](https://via.placeholder.com/150)

Figure 5. Percent of respondents who checked that the various external pests were a problem in their cattle operation, high vs low weaning weight groups.
quitoes (Figure 5). The difference was statistically significant for horn flies, cattle grubs, lice, ticks, coccidiosis, and tape worms. This may imply that producers in the HW group were more likely to monitor their herd for pest problems and to recognize the different pests.

Fourteen percent of producers in the HW group did not have fire ants, while only 6 percent of producers in the LW group reported no fire ants. There was no significant difference between the weaning weight groups in percent of respondents reporting economic loss due to fire ants. Forty-two percent of the producers in the LW group marked that fire ants were "just a nuisance" compared to 31 percent of the producers in the HW group.

Several factors from the survey results indicate that the producers in the HW group were more likely to view pest control as an important part of their overall management program. A large majority of producers from both weaning weight groups marked "yes" when asked if control of pests was an important part of their cattle operation. The percentage of "yes" answers was significantly higher, however, for those in the HW group than the LW group, 92 percent to 83 percent, respectively (Figure 6). Also, a significantly larger percentage of producers in the HW group used some type of insecticide to protect their cattle or facilities from insect pests, de-wormed their cattle, de-wormed their cattle both spring and fall, rotated pest control products in order to avoid resistance development, and treated all their cattle with some pest control product in 1994.

Fifty-four percent of producers in the HW group said they understood the federal pesticide use record keeping requirements. A significantly smaller percent (43 percent) of producers in the LW group reported that they understood the requirements. A significantly higher percentage of producers in the HW group (compared to producers in the LW group) used pasture rotation (62 percent to 55 percent), segregated infected animals (26 percent to 20 percent), and used dung beetles for manure management (3 percent to 1 percent) as non-chemical pest control practices.

With both weaning weight groups Ivomec Pour-on® was the most popular chemical pest control product followed by Ivomec Injectable®, Co-Ral Spray®, and Co-Ral Dust®. However, for each of these top four products as well as for most all of the other products a higher percentage of producers in the HW group than in the LW group reported their use.

A significantly higher percentage of producers in the HW group than in the LW used ear tags, injectables, and sprays to apply pest control products. However, a significantly higher percentage of producers in the LW group used back rubbers than those in the HW group.

Although these results indicate that the HW group uses more pest control (chemical and non-chemical) management practices than the LW group, the use of these products does not contribute solely to their placement in a group or to the weaning weights of their calves. Other factors such as breed selection, nutrition, calving season, etc., affect weaning weight as well. It is mainly of interest to note that the HW group utilizes more pest control practices than the LW group.

**Responses by Region**

In order to check for differences in responses among the different areas of the state, seven regions were chosen based on groupings of the 12 districts of the Texas Agricultural Extension Service. Some Extension districts were combined because there were not enough responses from those districts for a meaningful analysis, and the land resource types were similar for the purposes of pest control comparisons. The regions chosen were: Districts 1, 2, and...
3-Northwest; Districts 6, 7, 10, and 12-Southwest; District 4-North; District 5-East; District 8-Central; District 9-Southeast; and District 11-Coastal Bend (Figure 7).

Horn flies were the leading external pest problem in all the regions. Mosquitoes were a bigger problem in the Southeast; cattle grubs were more of a problem in the Northwest and Southwest; lice were a bigger problem in the Northwest; and ticks were a greater problem in the North, Northwest and Southwest areas of the state. It has become evident that fire ants are a strong predator species and have reduced tick problems in the East, Central, Southeast and Coastal Bend regions.

The percent of producers reporting that stomach worms were a problem in their cattle operation ranged from 90 percent in the Southwest region to 98 percent in the North and East regions. Northwest region producers had the greatest problem with coccidiosis (50 percent); Coastal Bend producers had the biggest problem with cattle liver flukes (43 percent); and the North region producers reported the highest incidence of tape worm problems (42 percent).

For all pests (external and internal) horn flies and stomach worms were the two pests judged to cause
the greatest economic loss in the cattle operations in all seven regions (Figure 8). In all but the East and Southeast regions, horn flies were ranked higher than stomach worms as a major pest. Cattle grubs were the third most common pest reported similarly in the Northwest, Southwest, and East regions. Lice were third in the Central and Southeast regions, while liver flukes were third in the Coastal Bend region, and horse flies were third in the North region. In the North region, over a third of the producers listed horse flies as one of the two pests that cause the greatest economic loss.

More than 47 percent of the respondents in each of the five regions on the east side of the state reported either minor or major economic loss due to fire ants in 1994. Fire ants were much less of a problem in the west side of the state where only 10 percent in the Northwest region and 35 percent in the Southwest reported economic losses from fire ants.

A large majority of the producers in all the regions felt that control of pests was an important part of their operation. They used some type of insecticide in 1994 to protect their cattle or facilities from insect pests, de-wormed their cattle, rotated pest control products at least once a year to avoid resistance development, treated all their cattle with some pest control product in 1994, and implemented at least one non-chemical pest control practice. In all these cases except de-worming and using
non-chemical pest control practices, producers in the Southeast region were least likely to respond positively. It is interesting to note also that the Southeast region had the lowest percentage of any region of cow/calf operations with average weaning weights over 500 pounds.

In all the regions, more than 70 percent of the producers used some non-chemical pest control practices. Producers in the Central region were most likely to use non-chemical pest control practices, while producers in the East region were least likely. Over half the producers in the North, Southwest, Central, and Coastal Bend regions used pasture rotation as a means of pest control. Except for the North and Southeast regions, more than 40 percent of producers in all regions tried to minimize pest problems by keeping feeders and waterers sanitary. Pasture burning was more likely to be practiced in the Northwest and Southwest regions than in the rest of the state. Producers in the North region were more likely to isolate new animals from the herd; producers in the Northwest region were more likely to move cattle to open pastures to avoid horse flies; and producers in the Southeast region were more likely to separate calves from mature animals than producers in the other regions.

Ivomec Pour-on® was the number one chemical pest control product used by producers in all regions. Usage ranged from 56 percent in the Southeast region to 73 percent in the East and Central regions. The second most popular product was Ivomec Injectable® in all but the Northwest region where Co-Ral Spray® came in second and Ivomec Injectable® third. Co-Ral Spray® was third in all the other regions except the North region. Co-Ral Dust® was the third most common chemical pest control product used in the North region. Co-Ral Dust® has been reformulated as an over the counter product and does not require applicator certification for purchase.

The principal method for applying chemical pest control products was as a pour-on in all seven regions. Injectable followed pour-on in the North, Central, Southeast, and Coastal Bend regions and spray was second in the Northwest, Southwest, and East regions. In the Northwest and East regions injectable came in third. Injectable was tied for third with dust as the most popular application method in the Southwest region. Spray and ear tags tied for third in the North region. Spray was third in the Central and Southeast regions and dust third in the Coastal Bend region.

Changes in Pests and Pest Control Practices

A similar survey of pests and pest control practices was conducted via telephone in 1981. Some interesting changes have occurred in pest problems faced by Texas beef cattle producers in the 13 years between the two surveys. Most notably, ticks and cattle grubs are much less of a problem now than in the past (probably due to the influx of fire ants and the introduction of the avermectins), and horn flies seem to be a greater problem.

Horse flies, cattle grubs, mosquitoes, and house flies were the insect pests most difficult to control according to respondents of the 1981 survey. Data was not given in the 1981 survey results on the difficulty of controlling horn flies. In this most recent survey, horn flies were reported to be the insect pest most difficult to control followed closely by mosquitoes, house flies, and horse flies. Only 20 percent of the 1994 survey respondents said cattle grubs were difficult to control.

In both surveys, producers were asked to list the two pests that caused the greatest economic loss in
A majority of producers (87 percent) reported the use of insecticides to control external pest problems.

- De-wormers were used by 88 percent of the producers responding to the survey.
- Producers that have higher weaning weights (calves of more than 500 pounds) were more likely to control pests both with chemical and non-chemical control methods in comparison to the group with calves of lower weaning weights.
- The pour-on formulation of pesticides was the most popular pesticide formulation.

General Recommendations

The following general guidelines are provided to assist our audience in considering profitable management practices for use in their beef cattle operations.

- The chemical industry, research and education groups should develop and market more affordable and practical fire ant control programs.
- Producers in the Coastal Bend, Southeast, East, North, and Central regions of Texas could benefit economically from well designed and timely treatments with de-wormers.
- Beef producers in Texas could produce heavier calves at weaning with horn fly control when populations exceed the economic threshold of 200 to 250 flies per animal.
- Producers can look for new avermectin products coming on the market to aid in pest control on beef cattle.
- Producers should contact their local veterinarian, county Extension agent, chemical company representative, or other educational source for guidance on the selection, timing, and application of the best pest management practices for pests in their individual operations.

- It is important to recognize that a problem with pesticide resistance can develop if different chemical types are not rotated in the product use pattern.

Future Trends for Livestock Pest Control

Texas livestock producers have made a significant shift in the type of pesticides used on livestock in the past 10 years. Avermectin, sold as Ivomec®, has become the dominant pesticide treatment for beef cattle. There will be a wide variety of new avermectin products in the livestock producer market place in six months to two years. Pfizer Animal Health will begin to market their avermectin product, Dora-mectin®, in 1996. Moxodectin® will come on the market in the near future.

Scientists working at the Knipling-Bushland U.S. Livestock Laboratory in Kerrville, Texas, have developed a new micropore injection system for livestock treatment. This new technology will greatly enhance the effectiveness of livestock pesticides. New formulations must undergo vigorous testing before the new technology will be in the marketplace. The present micropore experimental products are administered as a subcutaneous injection to animals. The potential improvement in residual pest control should have a major impact on the pesticide formulations used by Texas livestock owners in five to six years.

Contact the authors to obtain a copy of "Texas Beef Cattle Pest Control Practices," a more comprehensive report of the results of this survey.
References


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