Manure Handling Characteristics of High Plains Feedlots

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In the past 30 years, the cattle feeding industry in the Texas High Plains has undergone tremendous growth in fed cattle production: from 1,495,000 head in 1967 (Thomas et al, 1978) to 5,919571 head in 1997 (Bilbry et al., 1998) The growth in the Texas High Plains industry has been steady through the years indicating future growth is likely (Amosson, 1997). Major contributing factors to the expansion of cattle feeding in the area include economies of size in feedlot operations, proximity to feed grain supplied and large beef slaughter plants, favorable climate, readily available supplies of feeder cattle, and locational advantage to southern, eastern, and western markets (Dietrich et al., 1985).

The objective of this study is to identify operational characteristics of feedlots with respect to waste utilization, storage or disposal. The specific objective was to determine costs to producers, methods of disposal, manure handling equipment, cropland destination of manure and the level of producer education/information concerning the use and value of manure provided by feedlots.

Procedure

Mail surveys were sent to 208 feedlots in Texas, Oklahoma and New Mexico. Fifteen contract manure handlers in Texas were also surveyed in January of 1997. A second survey was sent to new respondents in February of 1997. No follow up was conducted of the non-respondents following the second survey. Copies of the surveys sent to feedlots and contract manure handlers is located in Appendix A.

Results

A total of 47 feedlots returned useable surveys. This represents a 22.6% response rate. Feedlot surveys were divided into size categories of less than 15,000 capacity and greater than 15,000 capacity for analysis purposes. The objective of the categorization was to identify potential differences in manure handling and environmental management between large and small feedlots.

A total of four contract manure handlers responded to the survey of which, three were useable responses. The three contract handlers worked with a total of 15 feedlots. Another three of the 15 contractors surveyed had invalid addresses. Therefore, the effective response rate was 25%.

A number of the feedlots responding to the feedlot survey were serviced by the responding contract manure handlers. Given the low number of contractors responding and the potential for double counting of some feedlots, the results of the contract manure handlers survey are not included in the text of this publication. However, results of the contractors survey are summarized and located in Appendix A for interested readers.

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Manure Handling, Cost and Distance

The general characteristics of who handles manure, what is the cost of moving the manure and how far they have to haul the manure are addressed in Tables 1-3. Contract manure operators collected the manure in 54% of the feedlots surveyed, Table 1. The larger feedlots tended to use contractors more, 67%, than did feedlots with less than 15,000 head capacity (38%). Therefore, the percentage of animals in which a contractor was used to collect the manure is significantly higher than the 54% of all feedlots using contractors.

Prices paid by the contractor and manure user did not vary significantly by size of feedlot in the survey, table 2. The average price paid by contractors for all feedlots was 7¢/ton. In turn producers were charged $2.15 per ton as a base price for the manure. The base price farmers paid was slightly less when the manure originated from a smaller yard ($1.99 vs $2.28). The average hauling charge was identical for both feedlot size groups at 11¢ per ton per mile.

The average hauling distance was 7.3 miles for land application of the manure overall responding feedlots, Table 3. The larger feedlots indicated a longer hauling range of 9.0 miles compared to the smaller yards at 5.2 miles.

Manure Use and Application Rates

An average of 70.5% of the manure hauled was utilized on irrigated crop land, Table 4. Dryland crop land was the destination of 26.1% of the manure hauled with rangeland application accounting for 3.4%. Larger feedlots tended to rely heavier on irrigated crop land (76.5%) while smaller yards utilized a relatively more balanced approach for utilization.

There was a significant difference between crop use of manure and application rate when comparing irrigated vs dryland use, Table 5. In contrast, there was not a significant difference in these factors between sizes of feedlots, therefore results by size of feedlot are omitted from Table 5.

Fifty-four percent of the manure distributed on irrigated land was used as fertilizer on corn production. Irrigated wheat land received 26.4 percent of the manure followed by sorghum at 9.8 percent, cotton at 5.8 percent and peanuts at 4 percent. Most of the dryland applications were on wheat ground (62.6%). The other major dryland crop recipients of manure were: sorghum (15.7%), corn (12%) and pasture (7%).

Application rates on irrigated crops ranged from three to forty tons per acre. On average, 7.5 to 15 tons were applied. Dryland application rates ranged from two to thirty tons per acre with an average application rate varying between 8.3 and 12.5 tons per acre. In general, dryland application rates tended to be 75 - 80% of irrigated application rates with the exception of cotton. Feedlots actually reported high average application rate on dryland cotton (12.5T/A vs 11.1T/A). The anomaly in the data is believed to occur due to the low number of reported applications reported on dryland cotton.

Sources, Manure Handling Operations and Equipment

Feedlots haul manure from a variety of sources. Over 54% of the manure was reported as hauled straight from the pens immediately after collection over all feedlots, Table 6. The remaining manure (26.6%) was hauled from mounds in the pens and stockpiles outside the pens that were more than two months old.

The sources of manure were not uniformly distributed by size of feedlot. The primary source of manure for larger feedlots tended to be mounds in the pens (41.6%). Larger feedlots utilized stockpiles more than two months old only 15.6% of the time compared to 18.3% of the time for smaller feedlots. As noted below, feedlots build mounds in the pens, especially during wet times of the year, to promote good drainage and provide a place for cattle to rest and stay dry.

In Table 7, the manure handling operation practiced in the feedlots by feedlot personnel and/or contractors are quantified. Two-thirds of feedlots surveyed build mounds in the pens. Approximately one-third of the feedlots build stockpiles outside the pens for temporary storage. During the summer and winter crops growing season, very little manure is applied. Temporary stockpiles allow on-site storage until farmers are ready to apply manure between crops. Thirty-eight percent of the respondents load the trucks and 17% reported actually spreading the manure in the fields. Very few feedlots are involved in composting the manure.

For the most part, patterns in manure handling operations were similar for feedlot size groups with two exceptions. Larger feedlots were twice as likely to build mounds in the pens than the smaller feedlots, 85% and 43%, respectively. Smaller feedlots were more inclined to spread the manure themselves, 24% compared to 12% for the larger feedlots.

The frequency of equipment utilized in manure operations is identified in Table 8. The most common equipment used in manure handling was spreader truck (89%), wheel loader (43%), dump truck (40%), and box scraper (32%) and a semi trailer (28%). Larger feedlots tended to use higher volume equipment such as box scrapers, paddle scrapers and semi trailers. Smaller feedlots utilized low volume equipment, such as, front end loaders, small dozers, etc. None of the feedlots reported using screening equipment.

Manure Information and Comments

Sixty-five percent of the feedlot operators indicated they provided nutrient information on the manure to farmers, Table 9. Information on application rates was given to producers 57% of the time, and economic value of manure as a fertilizer was provided less than 40% of the time.

Feedlot operators were asked how the demand for manure could be increased. Comments received to this question are given in Table 10. The dominate theme of the responses was increased producer education. The focus of the education effort should be economic value, application rates and nutrient content. Other items mentioned were improvement in quality and more applied research on manure and manure products.

Summary

A mail survey was sent to 207 feedlots in Texas, Oklahoma and New Mexico to determine their current environmental situation, manure handling practices and producer educational efforts on the use of manure. A total of 47 useable survey were returned for an effective response rate of 22.6%.

Respondents indicated the average price paid by farmers for the manure was $2.15/ton and 11¢/ton/mile to have it hauled and spread on their fields. Fifty-four percent of the feedlots used contractors to handle manure. Larger feedlots (greater than 15000 capacity) relied more heavily on contractors (62%) than did the smaller lots (38%). The average distance manure was hauled to reach fields was 7.3 miles. Length of haul for larger feedlots was slightly longer (9.0 vs 5.2 miles).

Seventy percent of manure disposed of was used on irrigated crop land. Fifty-four percent of the manure distributed on irrigated land was used as fertilizer in corn production. Twenty-six percent of the manure was spread on irrigated wheat land. Of the manure applied to dryland crop production, 63% went to wheat and 16% went for grain sorghum ground.

Fifty-four percent of manure is directly hauled to fields as it is collected. A majority of the remaining manure is hauled from mounds or stockpiles that are at least two months old. Because in pen mounds are used as a feedyard management tool, a considerable amount of manure is hauled from mounds 26.6% for all feedlots. There was a large variation in sources of manure by size of feedlot. Small feedlots tended to haul directly to fields after cleaning the pens (72.7%), while large feedlots hauled from mounds or stock piles at least two months old (60.5%).

Equipment used for manure disposal tended to reflect the size of the feedlot. Larger feedlots tended to utilize box scrapers, wheel loaders, paddle scrapers and semi trucks more than the smaller feedlot.

Information on manure utilization was provided to producers by feedlots in many areas. Sixty-five percent provided information on the nutrient content, 57% advised on application rates and less than 40% discussed the potential economic value of manure with farmer clients.

Conclusions and Implications

There has been very little change in the price of manure and the mechanics of manure harvesting and utilization over the last several years since the Bonner et al. 1992 study. While the studies are not directly comparable, it does appear the feedlot industry has made progress in becoming more current in manure disposal and more positive in providing information on utilization to farmers.

Comments made by feedlot operators clearly indicate a concern in the marketing of manure to producers. These concerns include quality, lack of information, and producer knowledge over the benefits of manure, and a lack of applied research.

A number of implications can be drawn from the study. First, applied research projects need to be conducted to identify the value of manure and manure products. Second, development of educational materials on the value and use of manure is essential. Finally, awareness meetings need to be conducted with both feedlot operators and producers to assist in raising the knowledge level on use, value and application of manure. Educational meetings with feedlot operators may need to focus on manure quality, types of information that should be provided and how it should be provided.

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Appendix A

Feedlot Manure Survey and Feedlot Manure Handlers Survey with Result Summaries.

Table 1. Feedlot and Contractor Manure Collection

Feedlot Size	Feedlot	Contractor
>15,000	38%	62%
<15,000	55%	45%
All Feedlots	46%	54%

Table 2. Prices Paid and Received by Manure Contractors

All Feedlots

Description	Average $/ton[1]	Respondents
Price to Feedlot from Contractor	$0.07	47
Base Price Paid by Farmer	$2.15	47
Hauling Charge	$0.11	47

[1]Rate expressed as $/ton/mile.

Feedlots 15,000 Head or less

Description	Average $/ton	Respondents
Price to Feedlot from Contractor	$0.10	21
Base Price Paid by Farmer	$1.99	21
Hauling Charge	$0.11	21

Feedlots larger than 15,000 Head

Description	Average $/ton	Respondents
Price to Feedlot from Contractor	$0.05	26
Base Price Paid by Farmer	$2.28	26
Hauling Charge	$0.11	26

Table 3. Hauling Distance from Feedlot to Farm

All Feedlots

Length of Haul in Miles	Average	Minimum	Maximum
Shortest	2.2	.25	25
Longest	18.1	2	100
Average	7.3	1	30

Feedlots 15,000 Head or less

Length of Haul in Miles	Average	Minimum	Maximum
Shortest	3.1	.25	25
Longest	16.3	2	100
Average	5.2	1	20

Feedlots larger than 15,000 Head

Length of Haul in Miles	Average	Minimum	Maximum
Shortest	1.5	.25	5
Longest	19.6	8	50
Average	9.0	4	30

Table 4. Percentage of Manure Applied by Land Type

Operations	>15,000 Head	<15,000 Head	All Feedlots
Dryland	23.3%	29.5%	26.1%
Irrigated	76.5%	63.1%	70.5%
Rangeland	0.2%	7.4%	3.4%
Total	100%	100%	100%

Table 5. Irrigated and Dryland Feedlot Manure Application by Crop.

Cropland Irrigated - - - All Feedlots

Crop	Avg. Applied tons/acre	Min. Applied tons/acre	Max. Applied tons/acre	% of Manure Applied
Corn	11.7	3	30	54
Cotton	11.1	10	20	5.8
Sorghum	10.5	5	25	9.8
Wheat	10.7	3	25	26.4
Pasture	15	10	40	
Peanuts	7.5	5	10	4
Other (Alfalfa, Grass)	20	15	25	

Total 100 %

Dryland Cropland - - - All Feedlots

Crop	Avg. Applied tons/acre	Min. Applied tons/acre	Max. Applied tons/acre	% of Manure Applied
Corn	9	2	20	12
Cotton	12.5	8	20	2.7
Sorghum	8.3	4	14	15.7
Wheat	8.5	2	20	62.6
Pasture	11.6	10	30	7
Other (Alfalfa)	15	15	20	

Total 100 %

Table 6. Manure Sources at Feedlots

All Feedlots

Source	Feedlots with Source Available	% of Time Source is Used
Hauled Straight from Pens Immediately after Collection	80%	54.2%
Hauled from Stacks or Mounds more than 2 Months Old in Pens	58%	26.6%
Hauled from Stockpiles more than 2 Months Old	38%	16.8%
Hauled from Compost Windrows or Piles that are Turned Periodically	9%	0.5%
Sediment from Holding Ponds, Collection Channels or Settling Basins	16%	1.9%

Larger than 15,000 Head

Source	Feedlots with Source Available	% of Time Source is Used
Hauled Straight from Pens Immediately after Collection	68%	39.5%
Hauled from Stacks or Mounds more than 2 Months Old in Pens	80%	41.6%
Hauled from Stockpiles more than 2 Months Old	44%	15.6%
Hauled from Compost windrows or Piles that are Turned Periodically	12%	0.8%
Sediment from Holding Ponds, Collection Channels or Settling Basins	20%	2.5%

Total 100%

15,000 Head or Less

Source	Feedlots with Source Available	% of Time Source is Used
Hauled Straight from Pens Immediately after Collection	95%	72.7%
Hauled from Stacks or Mounds More than 2 Months Old in Pens	30%	7.7%
Hauled from Stockpiles More than 2 Months Old	30%	18.3%
Hauled from Compost Windrows or Piles that are Turned Periodically	5%	0.1%
Sediment from Holding Ponds, Collection Channels or Settling Basins	10%	1.2%
		Total 100 %

Table 7. Manure Handling Operations Conducted in Feedlots by Feedlot Personnel or Contractors.

Manure Handling Operations	>15,000 Head	<15,000 Head	All Feedlots
Build Mounds in Pens	85%	43%	66%
Build Stockpiles, Outside Pens	31%	33%	32%
Reload and Spread Manure Stored in Field	8%	10%	9%
Unload Manure at Turnrow into Windrows	4%	0	0
Load Trucks from pens/stockpiles	42%	33%	38%
Spread Manure in Fields	12%	24%	17%
Compost Manure	0	5%	2%

Table 8. Equipment Utilized in Handling Manure.

Equipment	>15,000 Head	<15,000 Head	All Feedlots
Box Scraper	46%	14%	32%
Wheel Loader	92%	71%	83%
Bucket Loader	8%	14%	11%
Elevating (Paddle)Scraper	23%	5%	15%
Semi Trailer	35%	19%	28%
Spreader Truck	92%	86%	89%
Dump Truck	42%	38%	40%
Screening Equipment	0	0	0
Other (Track Loader, Front End Loader, Small Dozer, Tractor Pulled Manure Spreader)	0	19%	8%

Table 9. Manure Information Provided to Farmers.

Information Provided to Farmers	>15,000 Head	<15,000 Head	All Feedlots
Nutrient Characteristics	69%	60%	65%
Application Rates	54%	60%	57%
Economic Value of Manure	31%	50%	39%

Table 10. Feedlot Operator Comments on Improving the Demand for Manure

MORE THAN 15,000 HEAD

1. Reduce rocks, cement and metal (2 times)
2. Spend time with farmers about manure benefits.
3. If we could get rid of more than we produce.
4. Increase cost of commercial fertilizer.
5. Demand is good in this country, the present high price of commercial fertilizer helps.
6. More studies on economic value of manure study into a large scale composting unit.
7. Educate farmers on application options (5 times)
8. Market the value of manure. Farmers must be assured that they will get the manure applied when they need it.
9. Improve the consistency of nutrients. Trial data versus commercial fertilizer (2 times)

15,000 HEAD OR LESS

1. Farmers are not convinced it is good enough to use unless you pay all the costs for them.
2. Provide information stating manure has a three year efficacy and the value of organic matter increases.
3. Local articles that farmers might read.
4. Advertisement
5. Write publications as to how certain crops can use manure. For example, some farmers say not to use manure on underground crops such as carrots, potatoes, peanuts, etc.
6. More education to the farmer.
7. Increase the awareness of the value of manure to farmers in our area..
8. The value of the manure is dependent on the proximity of irrigated crop land and how plentiful the irrigated water. More water - More demand.
9. Determine the value difference for various soil types - what are primary attributes besides nitrogen.

Appendix A

FEEDLOT MANURE SURVEY

PLEASE RETURN THIS SURVEY IN THE ENCLOSED POSTAGE PAID ENVELOPE BY APRIL 18, 1997

1. Manure contractor servicing your feedlot:
   Firm Name: _____
   Contact Person: _____
   Address: _____
   Phone: _____

2. Who collects the manure from the pens? Feedlot 46% Contractor 54 % (Circle one)

3. Prices paid and received by contractors.

Price From Feedlot to Contractor	Base Price Paid by Farmer	Hauling Charge
.07 $/Ton	2.15 $/Ton	.11 c/Ton/Mile

4. Hauling distance from feedlot to farm:

   a) Shortest haul .25 (miles)
   Longest haul 100 (miles)
   Average (typical) haul 7.28 (miles)

   b) On the long hauls what crops is the manure typically applied to? Corn 65%, wheat 51%, cotton 16%, sorghum 14%, grass 6%, oats 3%, alfalfa 3%, peanuts 2%

5. What percentage of the manure from your feedlot is used in:

   dryland operations 26.1 %
   irrigated operations 70.5 %
   rangeland operations 3.4 %
   Total 100 %

6. Manure application rates by crop, irrigated and dryland.

	Irrigated Manure Application				Dryland Manure Application			
Crop	Minimum Applied Tons/Acre	Maximum Applied Tons/Acre	Average Applied Tons/Acre	% of Manure Applied %	Minimum Applied Tons/Acre	Maximum Applied Tons/Acre	Average Applied Tons/Acre	% of Manure Applied %
Corn	3	30	11.71	54	2	20	9	12
Cotton	10	20	11.14	5.8	8	20	12.5	2.7
Sorghum	5	25	10.5	9.8	4	14	8.25	15.7
Wheat	3	25	10.72	26.4	2	20	8.46	62.6
Pasture	10	40	15	—	10	30	11.6	7
Peanuts	5	10	7.5	4.0	—	—	—	—
Vegetables	—	—	—	—	—	—	—	—
Other (Grass) (Alfalfa)	15	25	20	—	15	20	15	(Alfalfa)
			TOTAL	100%			TOTAL	100%

7. Is your feedlot current on their manure collection, hauling and utilization with cooperating farmers (less than six month supply) 87.2 Yes 12.8 No (Check one)

If you are not current, what do you think the reason is? 1. Farmers hesitance 2. Failure from previous mgt. To try to sell the product 3. Trouble merchandising due to rocks.

8. Do you provide manure from the following types of sources at the feedlot to farmers? (Check all that apply.)

Check		Percent
80%	Hauled straight from pens immediately after collection?	54.2
58%	Hauled from stacks or mounds more than two months old in pens?	26.6
38%	Hauled from stockpiles more than two months old?	16.8
9%	Hauled from compost windrows or piles that are turned periodically?	.5
16%	Sediment from holding ponds, collection channels or settling basins?	1.9
	Total	100 %

9. What other parts of the manure handling operation is **the feedlot** involved in? (Check all that apply).

66% Build mounds in pens
32% Build stockpiles, outside pens
9% Reload and spread manure stored in field
0 % Unload manure at turnrow into windrows
0 % Other (specify) _____
38% Load trucks from pens/stockpile
17% Spread manure in fields
2% Compost manure

10. What types of equipment does **the feedlot and/or contract handler** normally use for manure collection, handling and spreading? (Check all that apply)

32% Box scraper (tractor towed)
83% Wheel loader
11% Bucket loader (tractor mounted)
15% Elevating (paddle) scraper
8% Other (specify) 1) Track loader 2) Front end loader 3) Small dozer 4) Tractor pulled manure spreader
28% Semi trailer
89% Spreader truck
40% Dump truck
0 Screening equipment

11. Do you or the manure handler provide information to farmers concerning: (Check One)

Nutrient characteristics	65% Yes	35% No
Application rates	57% Yes	43% No
Economic value of manure	39% Yes	61% No

12. In your opinion, what can be done to increase the demand for manure? See attached page.

Name of Your Feedyard

Date Completed

Question 12

More than 15,000

1. Reduce rocks, cement and metal (2 times)
2. Spend time with farmers about manure benefits.
3. If we could get rid of more than we produce.
4. Increase cost of commercial fertilizer
5. Demand is good in this country, the present high price of commercial fertilizer helps.
6. More studies on economic value of manure study into a large scale composting unit.
7. Educate farmers on application options (5 times)
8. Market the value of manure. Farmers must be assured that they will get the manure applied when they need it.
9. Improve the consistency of nutrients. Trial data versus commercial fertilizer (2 times)

15,000 or Less

1. Farmers are not convinced it is good enough to use unless you pay all the easter for them.
2. Provide information stating manure has a three year efficacy and the value of organic matter increases.
3. Local articles that farmers might read.
4. Advertisement
5. Write publications as to how certain crops can use manure. For example, some farmers say not to use manure on underground crops such as carrots, potatoes, peanuts, etc.
6. More education to the farmer.
7. Increase the awareness of the value of manure to farmers in our area.
8. The value of the manure is dependant on the proximity of irrigated cropland and how plentiful the irrigated water. More water - More demand.
9. Determine the value difference for various soil types - what are primary attributes besides nitrogen.

Appendix B FEEDLOT MANURE HANDLERS SURVEY

PLEASE RETURN THIS SURVEY IN THE ENCLOSED POSTAGE PAID ENVELOPE BY APRIL 18, 1997.

1. Feedlots serviced by your firm: A. _____ B. _____ C. _____ D. _____ E. _____

2. Do you collect the manure from pens at their feedyards? 100% YES ____ NO

3. Prices paid and received by contractors.

Price From Feedlot to Contractor	Base Price Paid by Farmer	Hauling Charge
.13 ≈ $/Ton	2.51 $/Ton	.11 c/Ton/Mile

If different among feedlots you service list below.

_____ $/Ton _____ $/Ton _____ c/Ton/Mile

_____ $/Ton _____ $/Ton _____ c/Ton/Mile

4. Hauling distance from feedlot to farm:

a) Shortest haul 0 (miles)
Longest haul 30 (miles)
Average (typical) haul 8.17 (miles)

b) On the long hauls what crops is the manure typically applied to? Corn 100%, Milo 100%, Wheat 67%, Alfalfa 33%

5. What percentage of the manure you handle is used in:
dryland operations 8.2 %
irrigated operations 91.2 %
rangeland operations 0 %
Total 100 %

6. Manure application rates by crop, irrigated and dryland.

	Irrigated Manure Application				Dryland Manure Application			
Crop	Minimum Applied Tons/Acre	Maximum Applied Tons/Acre	Average Applied Tons/Acre	% of Manure Applied %	Minimum Applied Tons/Acre	Maximum Applied Tons/Acre	Average Applied Tons/Acre	% of Manure Applied %
Corn	8	30	11	55	10	___	10	5
Cotton	10	20	10	7.5	5	10	-	7.5
Sorghum	8	12	10	20.0	5	10	-	57.5
Wheat	5	12	9	12.5	5	10	7.5	27.5
Pasture	___	10	10	2.0	3	10	8	2.5
Peanuts	___	___	___	___	___	___	___	___
Vegetables	___	___	___	___	___	___	___	___
Other Alfalfa	10	20	14	3.0	___	___	___	___
			TOTAL	100%			TOTAL	100%

Are the feedlots you work with current on their manure collection, hauling and utilization with cooperating farmers (less than six month supply) 100% Yes _____ No (Check one)

If they are not current, what do you think the reason is? _____

_____

8. Do you provide manure from the following types of sources at the feedlots to farmers you serve? (Check all that apply.)

Check		Percent
75%	Hauled straight from pens immediately after collection?	52.5
100%	Hauled from stacks or mounds more than two months old in pens?	16.3
50%	Hauled from stockpiles more than two months old?	30.0
0	Hauled from compost windrows or piles that are turned periodically?	0
25%	Sediment from holding ponds, collection channels or settling basins?	1.2
	Total	100 %

9. What types of equipment do you normally use for manure collection, handling and spreading? (Check all that apply)

25%	Box scraper (tractor towed)	75%	Semi trailer
100%	Wheel loader	75%	Spreader truck
0	Bucket loader (tractor mounted)	0	Dump truck
0	Elevating (paddle) scraper	25%	Screening equipment

0 Other (specify) _____

10. What other parts of the manure handling operation are you involved in? (Check all that apply).

50%	Build mounds in pens	100%	Load trucks from pens/stockpile
75%	Build stockpiles, outside pens	100%	Spread manure in fields
75%	Reload and spread manure stored in field	0	Compost manure
25%	Unload manure at turnrow into windrows		

0 Other (specify) _____

11. Do you or the feedlot provide information to farmers concerning: (Check One)

Nutrient characteristics	75%	Yes	25%	No
Application rates	50%	Yes	50%	No
Economic value of manure	50%	Yes	50%	No

12. In your opinion, what can be done to increase the demand for manure? 1) Keeping it clean of foreign objects and letting it out when the farmer needs it. 2) Get landlord to pay his part on rent of lease land. 3) Keep rocks and cement picked up in pens.

_____ _____

Company or Contractor Identification (Optional) Date Completed