SARE Project AS92-1

OPPORTUNITY FOR UTILIZATION OF SOUTHERN ARKANSAS POULTRY LITTER

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INTRODUCTION - BACKGROUND

Although southwestern Arkansas has long been an area of major poultry industry concentration, production has increased significantly in southern Arkansas over the past few years. Reasons for expanding poultry production into southern Arkansas are that the area has under utilized resources such as labor which, coupled with the growing demand for poultry, made the area attractive to certain processors. In the predominate poultry growing area of northwest and north central Arkansas, there has also arisen growing environmental concerns of long-term application of poultry litter to pasture-land. This practice has arguably already resulted in the degradation of water quality in several watersheds across northern Arkansas. In the southern areas of the state population is relatively sparse, the land is relatively flat, and the subsurface geologic material is relatively non-porous (as compared to northern Arkansas), consequently, increased poultry production appears at first glance to be an excellent idea.

However, these and other factors have created problems for poultry production in southern Arkansas. Among other problems, southern Arkansas poultry producers have been faced with the dilemma of how to dispose of their chicken litter. Disposal problems have arisen due mainly to the fact that in southern

Arkansas pine timber production is the main agricultural enterprise. Since most land is planted to trees,pasture acreage and cattle production are relatively low.

Exacerbating the disposal problem is pressure throughout Arkansas by environmentalists and regulatory requirements mandated by the Clean Water Act Amendments of 1987. The State already has a regulation mandating that disposal of liquid animal waste be accomplished only in approved ways. Also pressure exists to regulate the disposal of dry animal waste, although at present, a list of "best management practices" is being implemented through a voluntary program. Moreover, and even though not addressed by this paper, regulations on dead carcass disposal are becoming more stringent, thus increasing the costs to poultry growers.

The question then is what to do about the lack of available pasture land and cattle operations for disposal of poultry litter? Since poultry litter has long been recognized as a valuable soil amendment and as a cheap protein feed supplement, why cannot this by-product become a valuable asset instead of the costly nuisance it is perceived to be in several poultry processing areas?

A potential answer to both questions is to transport the litter to areas where its use will not increase environmental pressure on water resources and where its value is such that it will be an asset to those who produce it.

OBJECTIVES

1. To determine the market opportunities for processed poultry litter as a protein base for use in animal feed formulas.

a. To determine if processed poultry litter is nutritionally sufficient to be substituted in place of other feed ingredients.

b. To determine if it is economically feasible to substitute processed poultry litter for other feed ingredients.

2. To determine the market opportunities for poultry litter, processed or raw, as a soil amendment.

a. To determine if poultry litter can be economically and physically transported from southern Arkansas to areas of high demand, specifically the "Delta" region of eastern Arkansas.

b. To determine the most economical and feasible methods of marketing poultry litter.

OBSERVATIONS

The following observations are based on interviews with feedlot owners and nutritionists from Oklahoma, Texas, and Colorado regarding their most common concerns about the utilization of litter.

FEED

A. Litter as Feed - Utilizing poultry litter as a feed or feed supplement is not a new phenomena. Cattle farmers in Arkansas have used litter in combination with ground hay, corn, or other feeds

for many years both to cut costs and to supplement the protein content of high energy, low protein feeds.

The litter is usually composted which kills pathogens through a heat process and which may also increase digestibility. The litter is then mixed with one or more feeds. The resulting litter mixture is fed to stocker cattle prior to being shipped to a feedlot or to mother cows as part of their winter maintenance ration.

Although litter has been successfully utilized by farmers, major cattle feeders have not been enthusiastic for several reasons. First, simply because the product is "litter" or "manure", many people have an initial prejudice against the product. Already concerned about the public's perception of red meat and its relative drawbacks, the industry is naturally concerned about the potential backlash if it is known that cattle eat "manure".

Second, feedlots need a steady supply of a particular feed ingredient (e.g. corn, cottonseed meal, or alfalfa) which has a fairly constant nutritional value. Due to the variability of the protein content and digestibility of litter, these businesses are somewhat skeptical about litter. The ingredient litter would most easily replace is alfalfa, which makes up the bulk of the dry matter of a feed ration. However, feedlots require a highly digestible feed ration and the relatively low digestibility of litter mandates that litter could not substitute 100% for alfalfa.

Besides the above-mentioned problems with litter as a feed supplement, the most compelling reason to concentrate on litter as a soil supplement is cost or value. In order to interest the major cattle producers and feedlots in litter, one would have to deliver the product for $75-95/ton to Texas, Oklahoma, Kansas, or Colorado. Transportation costs over these distances make profitability doubtful. On the other hand, the same prices can be realized by sales to the major crop producing areas of Arkansas with considerably lower transportation costs.

ASSUMPTIONS:

1. Cost of litter at farm/ton	$10
2. Cost of clean out equipment/ton	8
3. Transportation cost to process point/ton	5
4. Processing cost/ton(if processed for feed)	50
5. Storage cost/ton	15
6. Destination cost/ton (200 mi)	16/ton

7. 100 tons/40 x 400 broiler house

8. 4 houses/day cleaned out

9. Estimated cost based on one clean-out crew; 10 ton/hour processing capacity; three 8 hour shifts;

B. Conclusion.

Large volume usage of poultry litter by major cattle producers and feedlots is doubtful at this time due to the following reasons:

1. Negative consumer reaction concerns

2. Variability of protein content

3. Relatively low digestibility

4. High transportation cost of litter to the markets

Poultry litter is well accepted as a supplemental source by small to medium size cattle producers in Arkansas. However, usage has declined in recent years because mixing the litter is labor intensive and time consuming. Reasonable grain prices in the past few years have also caused a decline in usage.

A few suggestions to increase usage of poultry litter for feed are as follows:

1. Develop a chicken litter base feed to be sold in bag or bulk to the small to medium size cattle producer. Examples would be a range meal and/or a creep feed for calves.

2. Some feeds have fillers, like mill trash or other types of grain waste. Chicken litter could be used in the same manner assuming it can be done economically.

SOIL AMENDMENT

A. Data Collection Phase - An attempt was made to contact every Conagra poultry grower in south Arkansas and north Louisiana by means of a questionnaire. Conagra agreed to deliver the questionnaire to all of its contract growers in these two areas. (Copy attached).

The questionnaire was designed to answer the following questions:

1. What is the size (number of houses) of the average farm?

2. How often (times per year) do the producers clean out?

3. What time of the year do the producers clean out?

4. How many clean-out contractors work in the area and what is the volume of their work?

5. What type of bedding material is most commonly used?

6. How much poultry litter is currently sold as opposed to being used by the producer?

7. Would the producers be willing to sell or trade their litter? (e.g., for bedding material)

8. If litter is being sold, what is the average price received?

9. Would the producer be willing to make a long-term commitment to sell his/her litter?

B. Confirmation of findings - We met with Conagra officials to discuss the purpose and results of the survey. Not only was accuracy of the results important, it was critical to know if Conagra would support our efforts and be willing to allow us to coordinate their bird pick-up and placement schedule to our clean-out schedule. We also needed to know Conagra's requirements for back hauling bedding material on litter trucks.

C. Interviews - It was important to know if producers felt like poultry litter was a problem or an asset. In addition to discussing the questionnaire, we wanted to learn if, for example, did the producer have future plans for disposal and, what was the reaction to voluntary BMP's or regulations.

WHAT WE LEARNED

A. Questionnaires - Answers 1-9

1. The average size farm consists of four broiler houses.

2. The producer typically cleans out once a year.

3. "Clean out" is usually in the spring, late April or May.

4. There are no "clean out" contractors in the area.

5. Rice hulls are the predominant bedding material.

6. Virtually none of the litter is currently being sold.

7. Virtually all of the producers who do not use their litter would be willing to sell it and most would be willing to trade for bedding.

8. It was difficult to determine the going price for litter since so little is being sold.

9. The majority of producers would be willing to enter into a long term commitment (e.g. three to five years) to sell their litter.

Summary of Questionnaire

1.	# of farms having 1-2 houses	19%
2.	# of farms having 3-4 houses	50%
3.	# of farms having 5-6 houses	26%
4.	How many farmers do not use their litter?	50%

5. 77% cleanout between March and May.

B. Producers

From visits to the South Arkansas area and from phone interviews, we confirmed that there is little open land for litter application. It is not atypical in either south Arkansas or north Louisiana to have only 10-25% of the total county acreage open. Therefore, where litter is being applied, the application rates annually are very high. It is estimated by ConAgra that as much as 8-10 tons of litter per acre per year are being applied to some farms.

Best management practices require that soils be tested annually where litter is being applied. Producers and Conagra have concerns that these tests will show high nitrogen and phosphorus levels which might prevent further applications for a period of time.

Moreover, when a producer does not have the land to utilize the litter and cannot find someone who will take his poultry litter, or if weather conditions prevent land application, the practice is to stock-pile the poultry litter uncovered and without runoff prevention measures. This does not comport with best management practices and opens the producers and companies to criticism and possible regulatory scrutiny.

As a whole, the producers in this area consider their poultry litter a problem and liability. The majority of producers are anxious and willing to work towards a permanent solution to the disposal problem.

C. Conagra

In several interviews with Conagra, company personnel confirmed the findings of the questionnaire. Conagra is willing to allow use of their placement and pick-up schedule to coordinate the clean-out and bedding of producer's facilities.

Like producers, Conagra is concerned about the compliance with best management practices due to the scarcity of open land in the area. Moreover, their concern has been heightened by the fact that potential pollution from litter run-off is being perceived as the responsibility of both the producer and the company.

Conagra has indicated a willingness to assist efforts to alleviate the environmental pressure of too much litter and too little land for application.

D. Delta Farmers

On July 1st, 1993, a meeting was held in McGehee, Arkansas with a group of row crop farmers and extension agents to discuss the use of poultry litter on row crop land. The meeting was arranged by Paul Brown and Dr. Fee Busby with Winrock International and assisted by State Senator Jim Scott.

The focus of the meeting was to address the following concerns:

A. Is there a demand or opportunity to move poultry litter from Columbia, Union and Calhoun counties in South Arkansas into Ashley, Deshea, Chicot and Drew counties in South East Arkansas?

B. What concerns does the row crop farmer have in the use of poultry litter?

C. What is the crop farmer willing to pay/ton for Poultry litter?

The meeting was very disappointing because demand and enthusiasm for poultry litter in this area was minimal. The farmers and extension agents were comparing the nutrient value of poultry litter to commercial fertilizer and not recognizing the value of poultry litter as a soil amendment.

From a cost standpoint, both the farmers and the extension agents were comparing fertilizers without acknowledging the benefits of the organic matter in the litter. Their opinion was the crop farmers count not pay more than $15-25/AC for poultry litter. At application rates of 1,000-2,000 lbs/ac, they would only pay $7.50 - $25.00/ton.

Dr. Rick Norman attended the meeting and stated that his research on poultry litter (broiler) revealed that the most dramatic results were observed on precision leveled ground. He acknowledged that his research was not complete, but the results so far on high fertility soils were not as dramatic. He also stated that although the nutrient value of poultry litter was low, this was offset since nutrients were released slowly over time. Finally, Dr. Norman stated that the high concentration of organic matter in poultry litter was beneficial to the soils and appeared to aid the soils in utilization of the nutrients from commercial fertilizers.

The farmers expressed some minor concerns about the availability of litter when and in the amounts it was needed. These concerns can be overcome. A more difficult concern was that the farmers were not convinced that poultry litter would help their

production or bottom line. The most disturbing attitude displayed was that poultry litter was an environmental problem and the row crop farmers did not feel that they should "pay" for the poultry producer's problem in order to bring the same problem into their areas. There is a real need for poultry litter education to address both the farmer's and the extension agent's concerns.

At present, the lack of information and understanding of poultry litter translates into little demand or opportunity to move poultry litter from South Arkansas into Southeast Arkansas. On the positive side, more rice producers are recognizing the benefits of poultry litter on precision leveled ground. There is beginning to be some moderate demand generated in these areas for poultry litter. As more benefits of poultry litter are documented, demand should increase accordingly.

PROBLEMS & SOLUTIONS

Problem #1 - Market demand for poultry litter. At the present time it is difficult to determine how large the market demand is and exactly where the demand is concentrated. Until poultry litter is widely accepted as a dependable fertilizer/soil amendment, demand by the most obvious sector of agriculture, row-crop operations in the Arkansas/Louisiana/Mississippi delta, will be sporadic.

Solution - (a) Contract orders for poultry litter from crop farmers in late summer and/or early fall. This determines tonnage demand and area to transport from and to.

(b) Set up a brokerage service in the area of greatest demand/potential/past use.

Problem #2 - Poultry producers clean-out during late April early May. Row-crop farmers want litter in fall for wheat and early spring (late March early April) to put under beans and rice.

Solution - (a) Establish distribution center near the area of greatest demand and have a ready supply in storage when needed.

(b) Coordinate some of the clean-out of litter to occur during late summer to late winter so that the supply is available before or during the greatest demand period.

Problem #3 - Price/ton for Litter. The market price for litter is erratic with no set criteria established for quality. Therefore, some farmers in some areas are able to buy litter for less, but do not realize that the litter is of poor quality and of limited value.

An example of this is when litter is utilized after only one flock of broilers. Since most litter is cleaned out after 3-6 flocks, one flock litter is of relatively little nutrient value. Not only is the quality of litter affected by the number of flocks per clean-out, but is also affected by the type of poultry being grown (pullets, broilers, layers, turkeys) and the amount and type of bedding (wood shavings v. rice hulls).

Also, the distance between the source and end-user affects the cost since transportation adds significantly to the price that must be received by the seller or broker to make a profit. Finally, if

back-haul arrangements cannot be made, transportation costs increase even more.

Solution - (a) More education on the use and value of litter is needed. If extension service personnel, consultants, and researchers are convinced of the value of litter, the farmer will follow.

(b) Areas of demand and tonnage need to be determined so back-haul arrangements can be made and transportation costs minimized. At present, an average of 200 miles is the predicted distance from supply source to area of use.

Problem #4 - More research is needed. Rice and precision leveled ground with added litter has been the focus of the research so far. Research on the effects of poultry litter on cotton, soybeans, wheat, corn, grain sorghum and vegetables needs to be completed and released. This research needs to show the relative benefits of the use of poultry litter, not only in terms of short-term profitability, but also as long-term solutions to the ever-increasing problems such as organic matter loss, water demands, pesticide usage, and salt buildup from extensive inorganic fertilizer use.

Solution - Again , more education and research is needed. Most of the pressure brought to bear on agriculture is a direct result of the Clean Water Act and its mandate that non-point source pollution be regulated and reduced. Unless federal concentration is diverted to other areas of concern, tighter scrutiny of agricultural practices is inevitable. Therefore, a coordinated effort is

necessary to alleviate the over-application of litter in some areas of Arkansas and to utilize this valuable resource in other areas of the state where it will improve the long term viability of important natural resources.

Problem #5 - Funding sources to establish an entity to handle the marketing and transporting of poultry litter is necessary.

Solution - The entity would purchase the poultry litter well in advance of the anticipated time of demand. This would require captal to purchase and store the litter for up to one year. The entity would also need equipment to clean out the poultry houses and transport the litter either to a storage and distribution facility or in the case of large orders, possibly to the site it will be utilizing. In order to succeed, the ability to purchase and store litter year round to meet demands in a timely manner is a must.

And lastly the entity would need aggressive marketing skills to continually develop strong, reliable and consistent demand to adequately match the supply. The most effective way to insure this goal would be to book or obtain orders that require deposits and establish tonnage ordered, and delivery dates. This would allow the properly balance between supply and demand.

Although the poultry hotline surely can be viewed with some success, such an operation is passive in nature. As stated above, a more aggressive and active approach to the problems and solutions is needed immediately. The resources and expertise to buy and sell

litter, and to transport litter from areas of great concentration to areas of great potential demand are available. However, without a significant source of capital to set up the mechanisms necessary to carry out such an enterprise, the opportunity for success is a hit or miss proposition.

LESSONS LEARNED

The media and environmentalists have labeled poultry litter as an environmental problem. Although this is certainly true in some instances, such criticism does little to alleviate the problems.

Little open land for application of poultry litter coupled with the low lying terrain increases the potential for an environmental problem. As in the past with other industries, the by-product of production and its safe disposal was an afterthought when poultry production increased in south Arkansas and north Louisiana.

Now, some row-crop farmers feel that the poultry producers and organizations are merely wanting to dump poultry litter problems on them. This is why research and education is so critically important. Row-crop farmers should be able to reap the benefits that livestock producers in western Arkansas have enjoyed for more than 30 years.

Soil Fertility. We have learned for the crop farmer wanting to use poultry litter that availability (both quantity and timing) and application are areas of concern. Both of these concerns can be addressed by a distribution center and contract order buying.

Summary. We have learned through our questions that the poultry producers in south Arkansas and north Louisiana need help and are willing to make long-term commitments to sell litter. Conagra is willing to lend assistance and give their blessings to an operation that will help their producers and alleviate the potential of water degradation.

RECOMMENDATIONS

Establishing the quantity and location of demand is the area that needs the greatest concentration. Until areas of firm demand can be determined, it would be premature to establish distribution centers and to enter into long-term commitments to purchase litter. More row-crop producer meetings and coordination with extension personnel, consultants and researchers is required.

CONCLUSIONS OR SUMMARY

That there is currently an available supply of litter in south Arkansas and north Louisiana is beyond question. A project that could develop and determine the potential demand for litter in the Delta is necessary.

Once demand is determined, funding would be required to establish a distribution center and begin purchasing necessary equipment, supply of litter, plus labor to begin transporting the supply to the distribution center.