

2010 Kentucky Legume Induced Bloat Assessment



Prepared by Dr. Jeff Lehmkuhler, Assistant Extension Professor with Assistance from the following individuals:

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Overview of the Situation

During the spring grazing season of 2010, reports of cattle losses due to ruminal tympany or bloat began to come in from Extension county agricultural agents. However, it was not clear at the time the magnitude of the situation. During the week of April 12th, several agents indicated that some producers were experiencing an exceptionally large number of bloat cases in grazing cattle. These same agents indicated a shortage of bloat prevention blocks from feed dealers likely due to the unexpected demand. An email was sent to agents on April 15 from UK Beef Specialist indicating the use of poloxalene as a preventative to legume induced bloating as well as feeding of hay. Input from experienced county agents was received and supported recommendations as well as provided input on strategies that were working for their clients. A week later, more agents continued to contact both UK forage and beef specialists indicating the high incidence of bloating of grazing cattle and a UK Ag News release was prepared and released during the week of April 19th. As well an informational piece was compiled that agents could utilize in county newsletters regarding frothy bloat and management strategies.

April of 2010 was abnormally dry in several counties (Table 1) and appears to have been worse further east in the state. This lack of precipitation was noted on several farm visits during April in Richmond. The dry weather is expected to have reduced grass growth and allowed establishing clover to compete with the forage. Precipitation was received the latter part of April and into May. The situation appeared to ease or at least calls seemed to lessen over the next few weeks following the precipitation. Later in May, bloat cases were ongoing for some operations, others began to have reoccurrence of bloat and yet many operations remained unaffected. The cases of bloat received by the Lexington Livestock Disease Diagnostic Center are shown in Figure 1 for each month of the year for the years 2005-2010. It is quite evident from this information that 2010 has been an abnormal year.

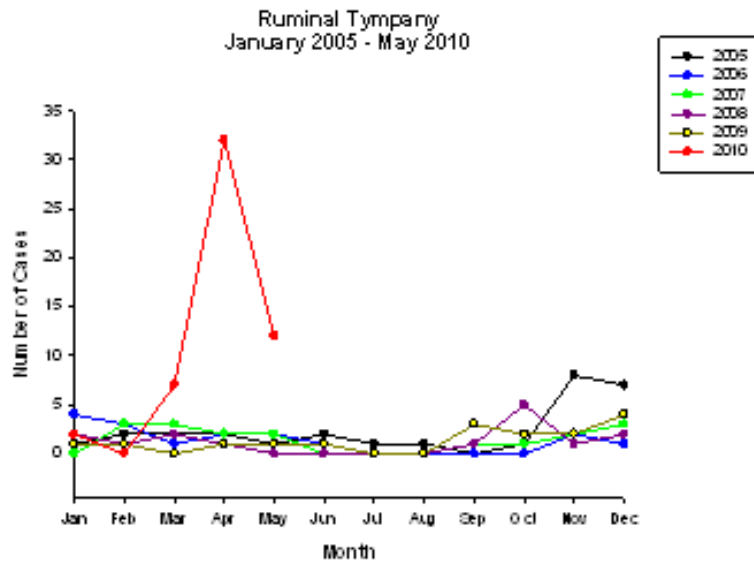
Table 1. Average precipitation for the month of April for select counties as reported by the Kentucky Mesonet.

County	2010 Precipitation, inches	2009 Precipitation, inches
Christian	4.64	6.64
Breckinridge	4.84	NA
Hardin	3.36	NA
Fayette	3.11	5.33
Carroll	2.38	NA
Madison	2.94	NA
Clark	2.21	NA
Harrison	2.99	NA

It was during the latter part of May that Mr. Dave Maples, Executive Director of Kentucky Cattlemen's Association, contacted the University of Kentucky regarding the extent of the situation. During this same time, FSA also contacted Extension specialists to determine whether or not this situation was weather related and if an estimate of the number of livestock impacted could be provided.

Extension specialists formulated a brief questionnaire to gather information that might assist in answering questions posed by FSA and KCA. The questionnaire was emailed to the Cooperative Extension Service Agricultural Agent listserv (see attached questionnaire). Counties were asked to contact at random 10-20 producers within their counties and complete the survey. A timeframe of seven working days was provided as it was implied that the information was needed promptly by FSA and KCA. A few days later the questionnaire was sent by the Kentucky Cattlemen’s Association to their constituents as well to provide an opportunity to obtain a greater number of responses.

Figure 1. Cases of ruminal tympany / bloat received by the Lexington Livestock Disease Diagnostic Center by month for the years 2005-2010.



The remaining portion of this report will be a summary of contributions provided by the various individuals working together to provide information and resources related to this unique situation as well as a summary of the questionnaire. It is important to understand that the incorporation of legumes into pastures is still considered sound management for Kentucky pastures and forage land and will continue to be a recommended practice. This is an unusual situation and should not be considered as a risk all producers will incur if they interseed legumes into their forage stands. It should also be noted that the data reported in this summary unfortunately does not answer the question as to how widespread the situation is as only 42 counties are represented. Additionally, the limited number of responses for some counties may not provide a clear picture as to the severity of the situation. At best, one could argue that if a single response indicated that cattle were lost to bloat during the 2010 grazing season, that particular county would be included into the region experiencing losses. Individual farm management strategies make this inference questionable and greater confidence would be placed on counties with a larger number of responses. I would like to thank all of the contributors for their efforts in compiling this report.

Stage Set From Drought – Dr. Ray Smith and Dr. Garry Lacefield

As Extension Forage Specialists we have been asked to comment on factors that have contributed to the abundance of clover in 2010. We have been in regular contact with livestock producers and industry throughout the state and we have heard about and seen an overabundance of white clover in many pastures this year. This has raised concerns about bloat and a number of farmers have experienced death losses due to bloat.

There are several reasons for the high percentage of white clover this year. Ironically the drought years of 2007 and 2008 set the stage. During those years many pastures in Kentucky were overgrazed due to restricted plant growth and they simply could not sustain the number of cattle on most farms. Even the pastures that were not overgrazed had thin stands as many pasture plants died due to drought. Simply put, there just was not enough forage to support the normal number of cattle raised on Kentucky farms. When normal precipitation returned during the fall of 2008 and spring of 2009 white clover that had been dormant in the soil for years had bare soil and perfect conditions to germinate and grow. Throughout 2009 clover continues to germinate and grow leading to a higher than average abundance. Additionally, the abnormally cool moist conditions during 2009 were perfect for white clover to spread due to aboveground runners or stolons. Ample precipitation continued during the fall of 2009 and spring of 2010 allowing additional seed to germinate and more spreading to occur and clover seemed to take over many pastures.

In short, the clover abundance of 2010 goes back 4 years with bare ground caused by drought in 2007 and 2008, and above average precipitation and cool growing conditions during 2009 and 2010. And although clover is very high quality and desirable as forage, too much clover can lead to bloat in grazing cattle.

Regional Issue

A limited number of questionnaire responses came from both the far western and eastern as well as the southern region of the state. Most of the responses received came from the central and north central region of the state as depicted in Figure 2. This regionalization of the situation appears to be further supported by the statement from Dr. Debbie Reed:

“At this point we have not seen any cows whose cause of death could be attributed to bloat.” June 7, 2010. Dr. Debbie C. Reed, DVM Case Coordinator, Breathitt Veterinary Center, Hopkinsville, KY.

The Livestock Disease Diagnostic Center in Lexington received cases from a variety of locations across north central and central Kentucky. Figure 3 illustrates the locations from which ruminal tympany cases were received by the Lexington Livestock Disease Diagnostic Center. It is uncertain as to how large of an area has experienced cattle losses from frothy bloat this spring using this information alone, but certainly depicts a relatively wide range across the central portion of the state as being at risk.

Figure2. Depiction of counties within Kentucky that completed and submitted at least one questionnaire during the 2010 bloat assessment time frame.

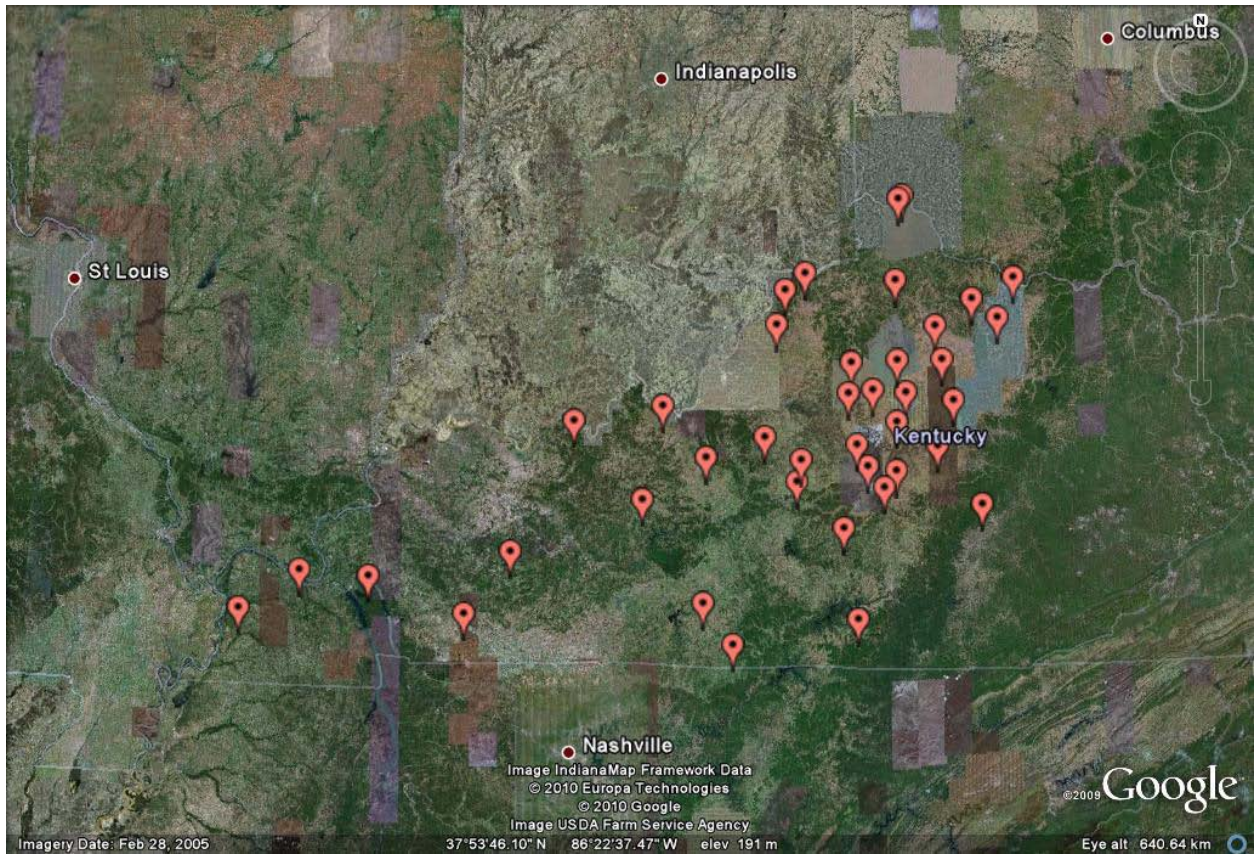
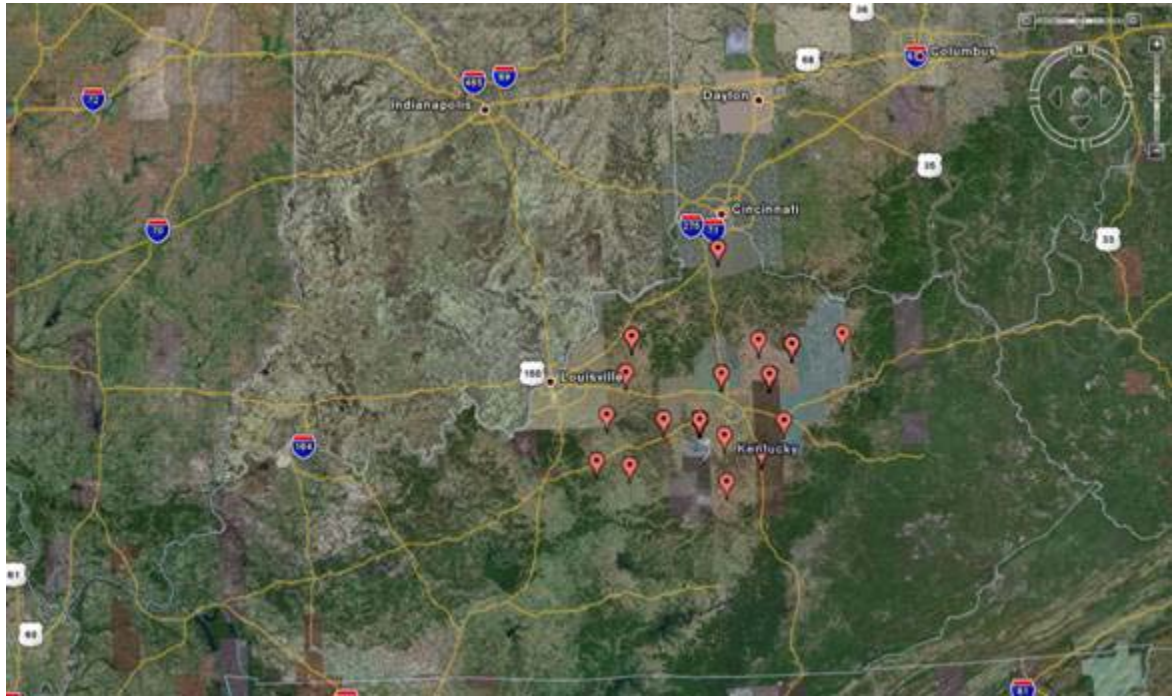


Figure 3 Location of ruminal tympany cases received by the Lexington Livestock Disease Diagnostic Center. (Source Dr. Craig Carter and Dr. Michelle Bilderback, Livestock Disease Diagnostic Center)



Legume Bloat Assessment – Dr. Jeff Lehmkuhler

At least one completed questionnaire was received from 42 counties across the state (see Figure 2). Survey responses were not received uniformly from across the state. Perhaps this is a reflection of this being a regional situation. Counties known to have beef cattle losses are more apt to respond than counties in which the problem is not as prominent or simply has not been an issue. Additionally, the timing encompassed the Memorial Day weekend and is also expected to have reduced the responsiveness.

A total of 295 questionnaires were received as of the time of preparing this summary. There are likely more to come in after the report. However, because news releases hit presses prior to this report being completed, all questionnaires will have to be critically evaluated for fear of a bias towards losses before being included into the data set.

The summary of the questionnaire results are reported in Tables 2 & 3. The responses represented 65,822 head of cattle. This includes all classes of beef cattle (i.e. cows, stocker calves). The minimum number represented per questionnaire was one head while the largest number of cattle represented per questionnaire was 3,600 hd managed at the beginning of the grazing season. Of the responses received, 36.3% of operations indicated they had lost cattle to bloat. Interestingly enough, nearly 17% of the respondents had lost cattle to bloat in previous years. In 2010, the number of operations experiencing bloat losses, based on the questionnaire data, is double that of respondents that lost cattle to bloat in previous years.

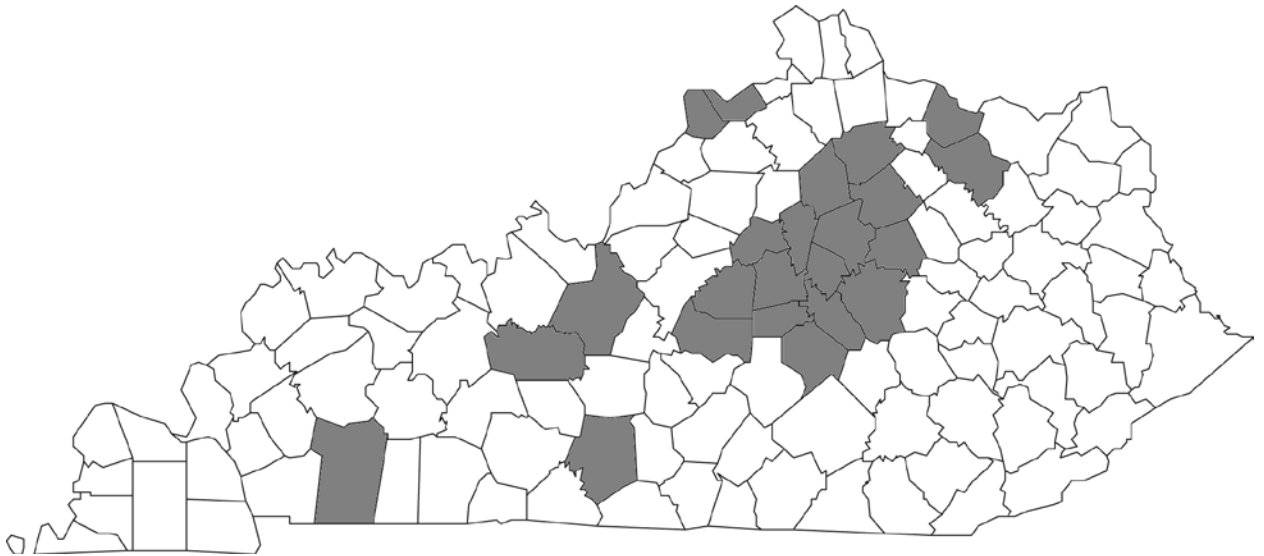
Table 2 . Summary of 2010 Kentucky of clover induced bloat questionnaire: Number of operations and cattle numbers represented by questionnaire responses.

Item	
No. of responses	295
No. of counties represented	42
Total No. of cattle represented	65,822
No. of responses that indicating cattle lost to bloat	107
% of responses with cattle losses to bloat	36.3%
Est. number of cattle lost to bloat	670
Cattle lost as a % of the total represented	1.0%
No. of respondents that lost cattle to bloat in prior years	50
% of respondents that lost cattle to bloat in prior years	16.9%

The estimated number of cattle lost to bloat based on survey responses was 670 head. Ranges were provided in the survey (i.e. 1-3, 4-6, 7-10) to make it simple and quick for data entry using drop down boxes in the electronic questionnaire form. The mean number within the range was used when calculating the number of cattle lost. When expressed as a percentage of the total cattle represented in the survey, the percentage of cattle lost to bloat was calculated to be 1.0%. Investigating data at the county level (data not shown), for counties having in excess of 1,000 head at the start of the grazing season, the range in the percentage of cattle lost to bloat was 0.12% to 2.57%. Of the counties

represented in the questionnaire summary to date, 23 of 42 counties had at least one respondent indicate cattle were lost to bloat. The counties experiencing bloat when expressed graphically based on responses presents a larger affected region than information from the diagnostic laboratories. This is to be expected as not all dead stock will be taken to a diagnostic center.

Figure 4. Counties reporting cattle losses to bloat during the grazing season of 2010 based on 42 counties reporting.



It is important to keep in mind when reviewing the above figure that not every county is represented. In fact, no eastern counties and few western counties submitted questionnaires. Many of these counties are large beef counties. There is no certainty the data obtained accurately reflects the magnitude of this unique situation. One can only make the assumption the responses are representative and attempt to extrapolate using the total number of cattle in a county. If one assumes a 1% death loss due to bloat, using the 2009 estimates of total cows/calves and beef cows for each of the counties that reported losses in the questionnaire and using an arbitrary value of \$600/hd, a projected value loss is calculated ranging from \$2.2 to nearly \$5 million for only beef cows and total cows/calves, respectively (Table 4). These figures do not include the preventative costs producers have incurred. Ranges in preventative costs are shown in Figure 5. Again, these data were collected by providing the ranges shown in the graph with the exception of the \$5,000-\$15,000 category. Producers were asked to specify the amount if in excess of \$5,000. The values above \$5,000 may be misrepresentative of actual preventative management and may include estimates of death loss. The preventative cost projections appear to be related to the number of cattle managed.

When further investigating the potential financial impact to estimate an upper limit, counties that had less than five questionnaire responses were removed. This left 18 counties represented in the survey data. There were 2.3 million total cows and calves and 1.114 million beef cows in 2009 according to the recent Agricultural statistics report from the Kentucky Department of Agriculture. Using the statistics from the counties having more than five responses and losses to bloat reported, these counties represented approximately 30% of the total cattle population. Using 1% loss estimate for the 18

counties plus 0.25% projected death loss for the remaining 70% of the state's cattle population, it is projected that \$6.6 million might be an upper limit estimate for total cows and calves while an estimated \$3 million is projected for the beef cow population in the state. Again, these values are based on using a fixed value of \$600 per animal and do not include preventative management expenditures.

It is important to note that the numbers provided are based on several assumptions using a limited number of responses. The actual severity of the situation is difficult to pinpoint. However, it is evident that many beef cattle producers are suffering financial losses, both in the form of death loss and preventative management. Several producers also indicated that they had experienced cattle losses to bloat in previous years. It is unlikely that the same magnitude or rather the same incidence rate would have been seen in previous years, but if it were, then the 2010 grazing season projected losses would be estimated to be approximately half the upper limits estimated above. Further, the economic impact was a very simplistic approach.

It is uncertain as to how much farm management practices may have impacted cattle losses to bloat during the 2010 grazing season. Visual inspection of fields and pastures would suggest that the current situation is connected to the abundant white clover growth this year. Approximately 72% of the respondents indicated they had interseeded clover into their pastures within the last five years (Table 3). This factor alone does not mean that interseeding legumes into pastures is the culprit. The number of cattle lost by respondents indicating they did not interseed clover during the years of 2005-2009 was 166 hd while 504 hd were reported for those indicating they did interseed clover. A shortcoming of the questionnaire was that the type of clover interseeded was not asked. When asked to rate the amount of clover in their pastures, the average response was a 4.1 on a 1-5 scale where 1 corresponded to "Devoid" and 5 represented "Nearly All Clover".

When asked if producers had implemented bloat prevention management strategies either prior to or following cattle losses, 52.5% indicated they had implemented preventative measures prior to losses. Breaking the number of cattle losses out by timing of prevention, 252 hd were lost if management was implemented prior to the first loss and 418 hd were lost when prevention was implemented following the first loss. This would suggest the need for educating producers on methods of assessing risk and the need to monitor and manage bloat risk. The vast majority were utilizing some form or a combination of prevent strategy currently.

Table 3. Summary of 2010 Kentucky clover induced bloat questionnaire: Management Practices and Prevention Strategies.

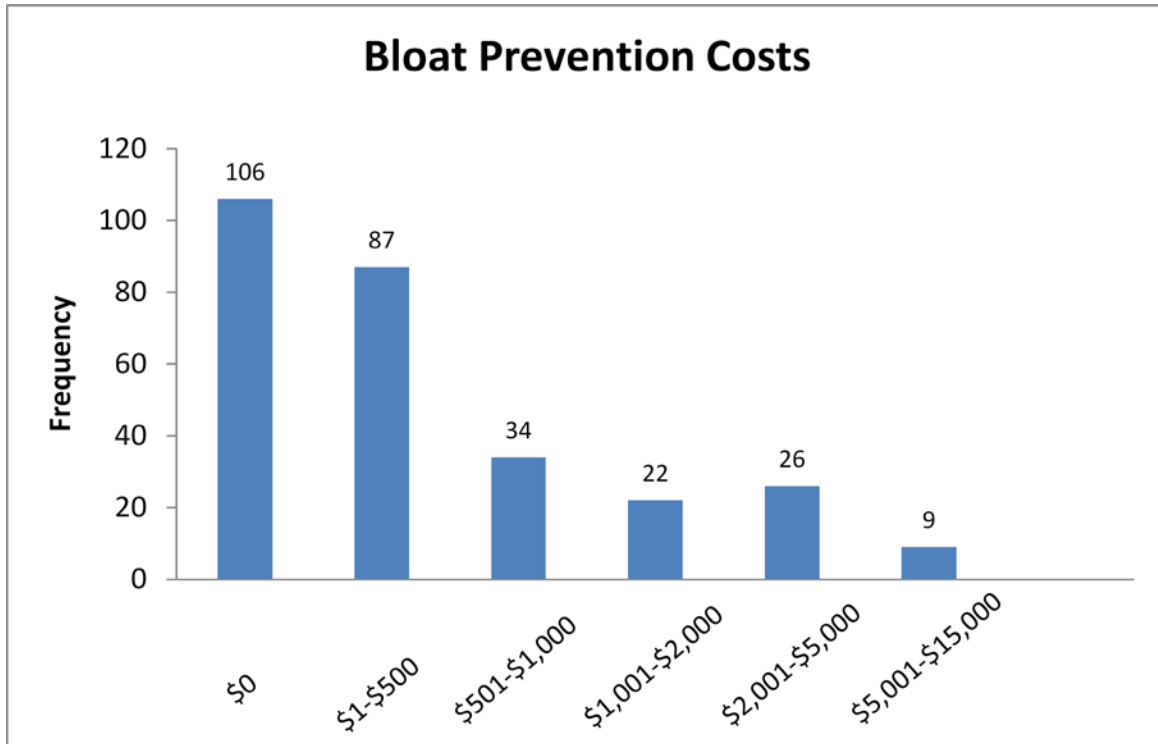
Item	
No. that seeded clover in past 5 years	213
% that seeded clover in past 5 years	72.2%
Average clover stand rating^a	4.1
% of respondents that were using bloat preventative strategies prior to losses	52.5%
% of respondents currently using bloat preventative strategy	72.2%
Preventative Strategy	
None	24.1%
Feeding hay	40.0%
Moving to pastures with less clover	32.5%
Rumensin	32.9%
Bloat block (poloxalene)	33.2%
Other	16.3%

^a Average clover stand rating: 1=Devoid, 2=Slight Amount, 3=Average, 4=Above Average, 5=Nearly All Clover.

Table 4. The total number of cattle/calves and beef cows by county as reported by USDA NASS, Kentucky office for 2009 and the potential impact of bloat losses based on all questionnaire responses.

	Total Cattle/Calves	Beef cows
Anderson	16900	7300
Barren	95000	38300
Bourbon	46000	22100
Boyle	24300	10200
Carroll	7900	5100
Christian	34300	14000
Clark	45000	18800
Fayette	15500	6400
Fleming	43000	19700
Garrard	38300	17000
Grayson	35200	20200
Hardin	36700	20000
Harrison	34700	18300
Jessamine	16100	9000
Lincoln	60000	21100
Madison	57500	25300
Marion	43000	21100
Mason	35000	13400
Mercer	46500	15800
Scott	23500	12600
Trimble	12700	8300
Washington	39000	19000
Woodford	19000	9500
Total		
No. hd	825100	372500
Est. No. Lost @ 1.0%	8,251	3,725
Value Loss, \$600/hd	\$ 4,950,600	\$ 2,235,000

Figure 5. Distribution of survey respondents and the estimated cost for preventative bloat management during the early-mid 2010 grazing season.



Appendix 1. Number of responses received by county as of the report.

County	No. Responses
Allen	7
Anderson	14
Barren	12
Bourbon	21
Boyle	12
Campbell	8
Carlisle	7
Carroll	1
Casey	1
Christian	2
Clark	10
Fayette	11
Fleming	10
Franklin	5
Garrard	9
Grant	1
Grayson	9
Hancock	1
Hardin	5
Harrison	15
Jackson	1
Jessamine	7
Kenton	1
Lincoln	20
Lyon	4
Madison	19
Marion	1
Mason	9
McCracken	1
Meade	9
Mercer	29
Monroe	1
Muhlenberg	2
Nelson	4
Oldham	3
Robertson	1
Scott	2
Trimble	2
Warren	1
Washington	5

Wayne	2
Woodford	10
Total	295