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Cattle Bloat on Clover Pastures*

By

H. E. Harris, A. H. McDaniel, and C. B. Roark†

INTRODUCTION

Bloat is a livestock problem that causes a heavy annual loss to stockmen. In Louisiana it is prevalent in the River Delta areas, but it is also a serious problem on the better developed clover pastures of the upland areas.

A study of bloat in cattle has been made at this Station along with the study of other factors in the management of highly productive pastures. A heavy growth of clover on these West Louisiana hill soils has caused severe cases of bloat and death from bloat to five head of cattle over a period of four years in an annual herd of about one hundred head of cattle.

The original cows of this herd were obtained from Texas and Oklahoma. Both the Aberdeen Angus and Hereford breeds were used in about equal numbers. This study involved the use of about 100 head of cows, calves, bulls, and heifer yearlings.

Although these cattle have been grazed on clover or clover and grass as early as January, they have shown little or no effects from bloat until about the first of April and after they had put on considerable flesh and the clover pasture was well developed.

Seven pastures were used in this study. Bloat has occurred in three of the seven. No symptoms of bloat have been observed in the other four. All pastures were grazed during the bloat season.

Cattle were turned on young, lush, heavy growths of clover or clover and grass mixture without regard for prior grazing or feeding. They were not given preventive measures or feed of any kind, unless they happened to be getting hay before being turned on pasture at the beginning of the grazing season. Cattle were turned on these pastures during all times of day and during all kinds of weather. They were allowed to graze at will day or night regardless of weather.

A sudden case of bloat has not developed during this study as a result of having suddenly turned cows on a good growth of any kind of pasture. It was always after they had been on a pasture several weeks, that they began to show symptoms of bloat.

Repeated cases of cows suffering from bloat have been relieved by turning the animals on a grass mixed pasture. As long as the cow remained on the grass and clover mixed pasture she suffered no trouble

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from bloat, but when returned to the clover pasture she suffered a recurrence of bloat until removed.

**BLOAT PRODUCING PASTURES**

The three pastures where bloat occurred were as follows:

1. White clover, Dallis grass (warm season), and Bermuda grass (warm season).
2. White clover, Dallis grass (warm season), and an unsatisfactory stand of rye grass (cool season).
3. White clover, Dallis grass (warm season), and a poor stand of fescue grass (cool season).

Bloat occurred in the white clover, Dallis grass, and Bermuda grass pasture in the early spring while there was an almost pure growth of clover and before the two warm season grasses had developed sufficiently to counteract the effects of the clover.

Later as the ground warmed up these grasses pushed through the clover and developed a balance between the grass and clover. At this stage of the grass growth bloat disappeared and even though there was a heavier growth of clover than previously, while bloat was prevalent, it was no longer easy for a cow to get a bite of clover without also getting grass with the clover. Bloat did not recur in this pasture after the grasses had made sufficient growth to balance with the clover.

In the second pasture, containing both rye grass and Dallis grass, there was a good stand and growth of rye grass except in an area of about one-half acre where there was no rye grass present. This gave opportunity for cattle to graze during early spring on a pure stand of clover. One case of bloat developed in this pasture. Later when the Dallis grass had developed, no further symptoms of bloat occurred.

Although the third pasture listed above contained fescue, a cool season grass, the stand of this grass was poor and there were areas of clover in which there was an insufficient stand or growth of grass. Later as the Dallis grass developed in this pasture, cows could get a balance of clover and grass and the occurrence of bloat disappeared.

**NON-BLOAT PRODUCING PASTURES**

The four pastures where bloat did not occur were:

1. Ladino clover and fescue grass.
2. Singletary peas and rye grass.
3. Louisiana white clover and fescue grass.
4. Crimson clover and fescue grass.

Each of the above four pastures contained a cool season grass, either fescue or rye grass. Cool season grasses are important because they develop early and come into production with the clover. Fescue and rye grass make their main growth while clover makes its growth. As soon as warm season grasses develop to the extent that they produce a good mixture of about half grass and half clover, the effects of bloat disappear equally as well in pastures containing warm season grasses as in the case of cool season grasses.
The proportion of grass to clover can best be maintained by an adequate supply of fertilizer of the right kind applied at the right time.

**EFFECT OF NITRATE ON A CLOVER-GRASS MIXTURE**

The percentage of grass in these pastures was influenced by the rate of seeding, but the level of nitrate in the soil had an even greater influence.

An experiment involving a ten-acre pasture was set up to determine the effects of different rates of nitrate on a Louisiana white clover and fescue pasture. Seeds were planted at the rate of five pounds of clover and twelve pounds of Alta fescue grass per acre in October. Fertilizer was applied at the rate of two tons of lime, one-half ton of basic slag, and 500 pounds of 3-12-12 mixed fertilizer per acre before planting.

This area was divided into plots of seven replications. During December, and after the grass was up to a good stand, the following rates of ammonium nitrate were used as a top-dressing:

1. No top-dressing.
2. 100 pounds ammonium nitrate, or 33.5 pounds of N.
3. 200 pounds ammonium nitrate, or 67 pounds of N.
4. 300 pounds ammonium nitrate, or 100.5 pounds of N.
5. 400 pounds ammonium nitrate, or 134.0 pounds of N.

The results for two years showed that fescue came to a good stand on all plots. But the rate of its survival was in proportion to the amount of nitrate used as a top-dressing. As the rate of nitrate increased, the percentage of grass increased.

Where no top-dressing of nitrate was used the fescue died out and a solid stand of clover developed.
Where 100 pounds of ammonium nitrate were used only about half enough fescue survived.

Beyond the stake, where 200 pounds of ammonium nitrate were used, the mixture of fescue and clover was about right.
The 300 pounds of ammonium nitrate used in the foreground almost crowded out the clover. Beyond the stake where no top-dressing was used the clover crowded out the grass.

Where 400 pounds of ammonium nitrate were used, the clover plants were very sparse, as is evident by the few clover blossoms.
SUMMARY AND CONCLUSIONS

Bloat may be a serious problem wherever the soil is sufficiently fertile to produce a heavy growth of clover. It has been controlled on the hill soils at the West Louisiana Experiment Station by maintaining a good stand and growth of a cool season grass, or of both a cool season and a warm season grass grown interplanted with the clover.

Two of the best cool season grasses to grow with clover at this location are fescue and rye grass. Two of the best warm season grasses are Dallis grass and Bermuda grass. There should be more than one pasture on each farm. Two good clover-grass pastures are: 1. White clover, rye grass, and Dallis grass; 2. White clover, fescue, and Dallis grass or Bermuda grass.

A small area of a pure stand of clover may continue to cause bloat even though the animal has access to large areas of a well developed grass and clover mixture in the remainder of the pasture.

Repeated cases of cows suffering from bloat have been relieved by turning the animals on a grass mixed pasture. In acute cases the animal was first relieved, then put on grass mixed pasture. As long as the cow remained on the grass mixed pasture she suffered no trouble from bloat, but when returned to the clover pasture she suffered a recurrence of bloat until removed.

For most satisfactory results in producing a clover-grass pasture, balance should be maintained in the fertility level of the soil. Heavy applications of one fertilizer is poor economy. Soils should be tested for their fertilizer needs in a soils laboratory.

Heavy rates of nitrogen should not be used, until the lime, phosphate, and potassium needs of the soil have been met. The use of excessive rates of nitrogen without first meeting the mineral needs may prove disappointing. Livestock must have an adequate supply of minerals in order to produce bones and maintain good health.

The important thing to remember is to maintain a good stand and growth of some kind of grass on every square foot of clover pasture during the entire clover growing season.