Yield Loss Due to Fire Ant Mounds in Hay Harvesting

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There is considerable anecdotal evidence that the presence of red imported fire ants (*Solenopsis invicta* Buren) have caused a major economic impact on hay production and resulted in the alteration of some basic production practices (Barr and Drees, 1996). The most dramatic change is the near-disappearance of sickle-bar type hay cutters in fire ant infested areas. Fire ant mounds combined with freshly cut vegetation cause clogs between the teeth of sickle-bars. The result is a swath of uncut grass, ranging from the width of a single blade to several feet with a proportional loss in yield. The alternative to missed cuts is for the operator to stop the tractor and remove the clog. In areas with many mounds, this becomes completely impractical as a stop could be necessitated every few yards to keep the cutter bar completely free of clogs. The reality of such a situation becomes a combination of both wasted forage and time.

Reports (Barr and Drees, 1996) indicate that such clogs are mainly a problem during the first cutting of the year when mounds are built up and moist. Once knocked down, fire ants tend not to rebuild mounds to as great an extent during the hot summer months. Even if mound-caused clogs and their accompanying skips only occur during the first cutting, they have a ripple effect into subsequent cuttings. Obviously, grass which is not cut and baled, reduces yield. It will likely be baled during the following cutting, but forage left uncut past its prime loses a very high percentage of its nutritive value, thus lowering the overall quality of the second cutting even though it may increase the quantity. Furthermore, particularly in the spring, standing cool-season grasses delay the development of the important warm-season grasses, such as coastal bermudagrass, resulting in lower yields and/or quality from the second cut. The end result of the many problems associated with sickle-bar cutters has been their almost complete replacement by expensive disk-type cutting equipment.

Despite all the reports of such problems, data on yield losses is now hard to obtain because sickle-bar cutters are so rare. In the spring of 2001, the authors had the opportunity to take measurements of yield loss in a field, cut with a sickle-bar mower, in which fire ant mound-caused skips were plainly evident.

Objective: Determine yield loss in hay cutting due to fire ant mounds clogging a sickle-bar mower.

Materials and methods

The hay field was located on the Ingram Ranch in Comal County, Texas within a few hundred yards of the Guadalupe River. On May 23, 2001 we first visited the site where strips of uncut forage were plainly visible. Ten random spots in the field were selected to run 50-foot linear transects perpendicular to the uncut swaths. The end of a measuring tape was placed on the ground and length measurements were recorded for where the unmowed strips began and ended. The data were later entered into a database and the total length, and therefore percentage, of lost forage calculated. Mound counts were also taken in a 10 foot wide strip along the transect to obtain a mound density figure.

Results and Discussion

The hay field in which these measurements were taken had an average mound density of 205 per acre. As shown in **Table 1**, the average number of skips - clogs caused by fire ant mounds - was almost eight per 50-foot transect. The result was an average 130 in., or almost 11 feet, of uncut forage for a given 50 foot swath, or nearly 22% lost forage. Undoubtedly, this is an enormous loss of productivity, but is it enough to offset the cost of fire ant treatments?

Table 1. Number, mean width (in.) and percentage of skipped (unmowed) strips per 50-foot transects taken perpendicular to mowing swaths. Ingram Ranch, Comal Co., TX. May 23, 2001.

	1	2	3	4	5	6	7	8	9	10	Mean ± std dev.
number of skips	4	11	7	9	9	5	7	12	7	8	7.9 ± 2.5
tot. width (in.)	74	188	85	224	150	57	78	201	119	126	130.2 ± 58.7
Percent skipped	12	31	16	37	25	10	13	34	20	21	21.9 ± 9.6

Using data from the 1996 Texas Cattle Producer's Survey (Barr and Drees, 1996), the average yield for square bale hay producers (n=41) was 65 bales/acre on the first cutting. Subtracting 21.9% from this yield equates to a loss of 14.2 bales/acre. At a reported average profit of $1.04/bale, the loss comes to $14.78/acre. At an average price of $7.00/pound and an application rate of 1.5 lbs./acre, the material cost to treat the field would have about $10.50/acre. Figuring in labor and machine time, the cost to treat this pasture for fire ants would be very close to the value of the lost hay. It is likely that the benefits of the treatment would carry forward to the next cutting, as well.

Caution must be used in extrapolating these results to other sites and situations. A density of 205 mounds per acre is fairly typical in Central Texas, but it was the height of the mounds and heavy clay soil that made them clog the cutter bar so easily. Fields with sandier soil, for instance, would likely have many fewer problems. The decision to treat to offset hay production losses is a very site-specific decision that should be based on actual field measurements and good record-keeping (A worksheet is available in Extension Publication B-6076, Managing Red Imported Fire Ants in Agriculture to help calculate these costs. Contact your County Agent or go to http://fireant.tamu.edu to obtain a copy.) Nevertheless, as shown here, even this one problem associated with fire ants in hay production could be enough to economically justify treatments.

Literature Cited

Barr, CL and BM Drees, 1996. Texas cattle producers' survey: impact of red imported fire ants on the Texas cattle industry. Tx. Ag. Extension Serv. Bryan, Tx. 77806.

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