



Wide Swathing for High Quality Forage

Decades ago, forage conditioning development significantly shortened the time it took to make dry hay. As haylage became popular, no one questioned the need for conditioning as part of the haylage making process. Mowing and conditioning, leaving forage in a narrow swath, saved a trip over the field. There are two management factors that have primary control of forage quality. The first is harvesting at the optimum quality stage; the second is the ability to maintain high quality forage throughout the harvest process, particularly during the typically wet spring season.



Figure 1. Comparison of conditioned wide vs. narrow swaths vs. unconditioned wide swath using a Kuhn 28' disc mower.

The longer it takes forage to dry before chopping, the longer that the forage continues to respire in the field, the longer the forage loses sugars and forage quality. A narrow swath protects much of the forage from drying forces (sunlight and wind), increasing the time it takes to reduce the moisture to 65-70% for chopping. Forage quality losses are particularly significant overnight. The basic concept of wide swathing is that laying out a mowed swath to a maximum width windrow will facilitate swath drying enough to allow forage to be chopped as silage on the same day that it is mowed.

Drying Factors

The most critical factor for accelerated drying is the amount of sunlight hitting the swath. This increases the swath temperature and the vapor deficit. It also allows for photosynthesis to directly use moisture to produce digestible carbohydrates and to allow moisture to escape through holes (stomata) in the leaf that are open during photosynthesis. The only way to control these factors is to mow on a good day, and lay the forage out in a wide swath! Wide swathing is much more of an issue for heavy spring growth of grass and alfalfa-grass when weather is typically uncooperative.

Wide Swathing Experiments

We have conducted several studies comparing narrow-conditioned swaths to conditioned and unconditioned wide swaths. Studies were done using large combination mowers (Fig. 1), or smaller 9' wide mowers, all were disc mowers.

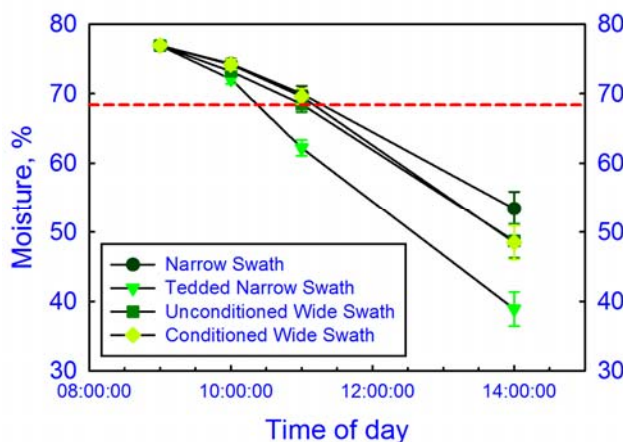


Figure 2. Four treatments of a 9' swath of 50% alfalfa, 50% grass. An unusually hot, windy day resulted in very rapid drying.

Tedding also has been tested, we tilled immediately after mowing (Fig. 2). On this unusual spring drying day, even narrow swaths dried relatively quickly, which rarely occurs. Tedding a swath to 100% of cut width resulted in the fastest drying, requiring only 1.5 hours to reach 68% moisture. Wide swaths were

90%+ of the cut width and were driven on. If soil moisture is not excessive, this will have minimal impact on forage quality.

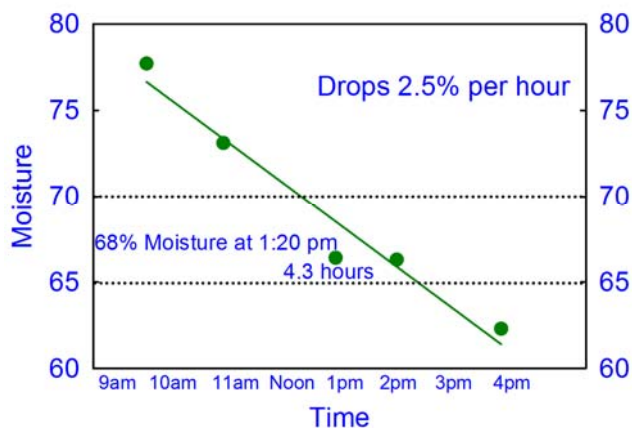


Figure 3. Mostly alfalfa swath, tedded to 100% of cut swath width on a normal drying day.

A mostly alfalfa stand mowed on a more normal drying day reached 68% moisture in 3.5 hours with wide swaths. Wide swaths dried about 2.1 percentage units/hour, compared to 2.5 percentage units/hour for tedding. Narrow-conditioned swaths dried too slowly for reasonable same day chopping.

Mowing late in the day results in slower drying than forage cut the next morning. Unconditioned forage tends not to absorb rainfall moisture like a conditioned sward will. It will also have less alfalfa leaf loss because moisture wicks through the leaves, instead of away from the leaves through smashed stems.



Figure 4. Disc mower with wide swathing attachments producing a swath 100% of the cut width. Alfalfa-grass stand.

Wide Swathing Issues

1. Harvest at optimum quality or forget it.
2. Swath needs to be 85-100% of cut width.
3. Mow only on good drying days, if possible.
4. Open conditioner wide or just remove it.
5. A conditioner is required for dry hay.
6. Disc or sickle bar mowers both work fine.
7. OK to drive on cut forage unless very wet.
8. OK to mow with the dew still present.
9. Hay mergers make the process efficient.
10. Equipment size must be matched to work.
11. Drying too fast is a common problem.

Summary

Mowing and chopping of forage on the same day eliminates forage quality overnight losses and can eliminate the risk of rainfall losses of quality. Wide swathing to 85% or more of the cut width does not require any conditioning to reach silage moisture for same-day chopping. This high quality silage will greatly improve the odds of profitable dairy farming in NY.

Additional Resources

- 2011 Cornell Guide for Integrated Field Crops Management. Electronically accessible at: <http://ipmguidelines.org/Fieldcrops/>.
- Cherney, J.H., D.J.R. Cherney, and D. Parsons. 2006. Grass Silage Management Issues. p. 37-49. In Proceedings from "Silage for Dairy Farms: Growing, Harvesting, Storing, and Feeding". NRAES-181. 23-25 Jan., 2006. Harrisburg, PA. Natural Resource, Agriculture, Engineering Service, Ithaca, NY.

Disclaimer

This information sheet reflects the current (and past) authors' best effort to interpret a complex body of scientific research, and to translate this into practical management options. Following the guidance provided in this information sheet does not assure compliance with any applicable law, rule, regulation or standard, or the achievement of particular discharge levels from agricultural land.

For more information



Cornell University
Cooperative Extension

Grass Management Manual
<http://forages.org>

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