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The NYS IPM Weekly field Crops Pest Report is at

http://blogs.cornell.edu/ipmwpr/#

Capital Area Ag Report
June 12, 2014

"The soil is the great connector of lives, the source and destination of all. It is the healer and restorer and resurrector, by which disease passes into health, age into youth, death into life. Without proper care for it we can have no community, because without proper care for it we can have no life."

— Wendell Berry, *The Unsettling of America: Culture and Agriculture*

Announcements

Wednesday, June 18th, 1:30pm-4:00pm—Growing Milling-Quality Grains in the Hudson Valley at Sparrowbush Farm: 2409 US Route 9, Hudson, NY 12534 (Columbia County). Join Ashley Loehr (Sparrowbush Farm) and baker-miller Antoine Guerlain (Camphill Village at Copake) in this rising discussion of milling grains in the Hudson Valley. This year's grain production at Sparrowbush Farm includes 7 acres of rye, 6 acres of Frederick winter wheat, a spring wheat trial of red fife & Glenn, and an assorted half acre of corn for grinding and popcorn for popping. This educational farm tour will focus on overcoming equipment challenges and incorporating grain production onto the diversified farm operation. Learn about growing milling-quality grains, and considerations when milling and baking with local grains. Let's build a grain growers network in the Hudson Valley! **SPONSORED BY NOFA-NY**
Registration: $10/person, or $15 for 2 or more from the same farm. Register with Stephanie by 6/16 at 585-271-1979 ext. 509 or **online**.

Weather Data—June 11, 2014

	Rain			GDD 86/50		GDD 41		GDD 48	
Location	Past Week	This Month	Since April 1st	Past Week	Since April 1st	Past Week	Since April 1st	Past Week	Since April 1st
Granville	0.0	0.0	6.4	115	640	176	945	358	1232
Whitehall	0.5	0.6	6.9	129	680	188	1004	407	1409
Argyle	1.3	1.8	6.7	117	633	174	913	376	1171
Jackson	0.0	0.0	5.1	120	643	179	943	364	1235
Easton	0.3	1.0	7.6	118	693	176	942	354	1219
Alb. Airport	0.5	1.8	6.8	128	727	187	1062	415	1543
Guilderland	0.0	0.7	1.8	118	691	177	999	369	1396
Castleton	0.6	0.9	6.8	123	693	180	1037	395	1451
Hudson	0.9	1.1	7.0	128	760	186	1112	431	1698
Redhook	0.9	1.4	7.0	122	740	179	1079	389	1575

Guilderland rain data is obviously suspect.

FYI

The latest issue of **What's Cropping Up** can be found at https://css.cals.cornell.edu/extension-outreach/whats-cropping-up. Articles include:

- Do Modern Corn Hybrids Still Exhibit Imbibitional Chilling Injury?Do Modern Corn Hybrids Still Exhibit Imbibitional Chilling Injury?
- Adapt-N Responds to Weather, Increases Grower Profits in 2013 Strip Trials
- New York Farm Delves Deeper with Adapt-N

Crops & Soils…Aaron Gabriel

Corn: If you are using a total post-emergent weed program, then be sure to check your fields to monitor weed and crop growth. Post-emergent herbicide applications should be made when the weeds are 2" to 4" tall. The corn seedling will detect weed competition and yield is reduced even if weeds are eliminated after the seedling stage.

I have been asked whether corn fungicides at side-dressing time should be made. I think that this is a gamble, since we can not predict future disease pressure. I recommend practicing **integrated pest management.** Rather than rely on fungicides for "insurance", first select disease resistant hybrids, rotate crops, manage residues properly, give the soil and plant proper nutrition, and plant properly to get the crop off to a good start.

Snails and slugs may be seen in some corn and soybean fields. The damage (pictures to the right) show how they eat strips of leaf tissue, sometimes leaving behind one epidermal layer (window pane) or eating completely through the leaf. Often you can see their shiny "slime trails" on the leaf (lower right picture). Crop residue management is our strategy for control.

Alfalfa: Alfalfa has pretty much been harvested. Alfalfa weevil larvae will feed on the re-growth. Check regrowth for feeding damage and determine if the larvae are small, medium, or large. If they are large, they will pupate soon and damage will end. If they are medium and 50% or more of the re-growing tips have damage, then you should consider applying an insecticide to stop the damage.

If you are applying manure or fertilizer after harvest, it is important to do it within a day or two of harvest. Wheel traffic will damage regrowth and reduce yield.

Grass: We had an interesting meeting last Wednesdaydiscussing how to get hay dry for baling. The Macerator 6610 and the Reconn 300 were demonstrated. The picture to the right, shows a stem with nicks from the Macerator rolls. These machines super condition the forage so that the stems dry faster. Added benefits are better digestibility and palatability because it softens up the forage as well, from the aggressive conditioning.

Maceratore 6610

Reconn 300

Small Grains: Many wheat and barley fields are at the critical stage of flowering. We have a rainy week. That is not good. For disease to develop you need three things (called the disease triangle): a susceptible host (like flowering grain); a pathogen (like Fusarium head blight, which has spores from local crop residue and blowing in from distant regions); and conditions conducive to disease development (wet, rainy weather). Our triangle is complete, and fungicides are in order.

The Fusarium Head Blight Prediction Center is at http://www.wheatscab.psu.edu/.
More small grain disease information (from Gary Bergstrom, Cornell) can be found at http://fieldcrops.org/SMALLGRAINS/Pages/Managingdisease.aspx

Getting Hay Dry: I have copied below an article by Dan Undersander (U of Wisc), that is very good. Another more indepth article, "Phsyiology of Hay Drying" can be found at http://mbfc.s3.amazonaws.com/wp-content/uploads/2012/07/7-1-3-Physiology-of-Hay-Drying-Undersander.pdf. It is well worth reading.

Also, the article on adjusting roller conditioners may be helpful. No matter the conditioner type, we want to crack and crimp stems, without mashing or tearing the leaves.

Some interesting points from these articles is that wind and relative humidity have a greater effect on drying rate than sunshine or temperature.

Some key points for getting hay dry:

- Keep cut hay off the ground on top of hay stubble high enough so air can get underneath.
- Conditioning stems is important, but do not damage leaves
- Moisture will move from the soil up into the cut hay, so hopefully the ground is dry. If not, let the ground dry between windrows and move windrows over dry ground.
- When the hay is raked into windrows, it is important to have fluffy windrows, so that air can move through them. As moisture leaves the plant, and hovers at the plant surface, wind must move it away for more drying to occur.
- Roller conditioners deposit a windrow with stems parallel to each other. This allows for the windrow to remain on the stubble longer without settling into it. Tine conditioners leaves stems in all directions, resulting in the windrow settling into the stubble faster.

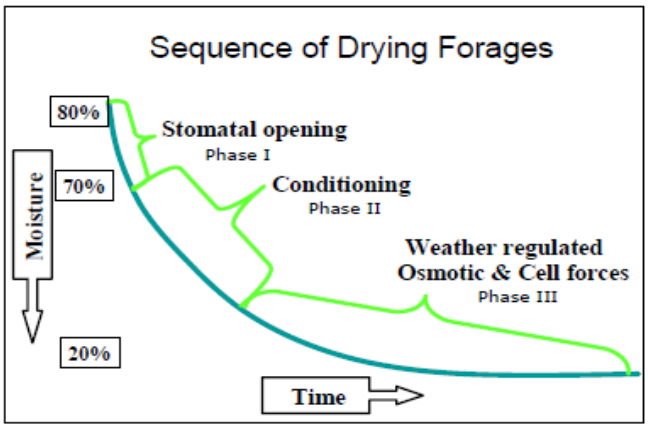
University of Wisconsin–Extension

Drying Forage for Hay and Haylage

Dr Dan Undersander
University of Wisconsin

If we understand and use the biology and physics of forage drying properly, not only does the hay dry faster and have less chance of being rained on, but the total digestible nutrients (TDN) of the harvested forage are higher. As mowing and conditioning equipment has evolved, some of the basic drying principles of forage have slipped by the wayside and we need to review them.

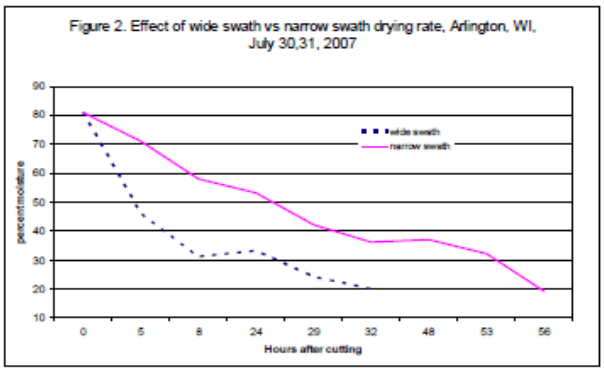
The general pattern of drying forages is shown in the figure at right. When forage is cut, it has 75 to 80 percent moisture must be dried down to 60 to 65% moisture content for haylage and down to 14 to 18% moisture content for hay (lower figures for larger bales).



The first phase of drying is moisture loss from the leaves through the stomates. Stomates are the openings in the leaf surface that allow moisture loss to the air to cool the plant and carbon dioxide uptake from the air as the plant is growing. Stomates open in daylight and close when in dark and when moisture stress is severe. Cut forage laid in a wide swath maximizes the amount of forage is exposed to sunlight. This keeps the stomates open and encourages rapid drying which is crucial at this stage because plant respiration continues after the plant is cut. Respiration rate is highest at cutting and gradually declines until plant moisture content has fallen below 60%. Therefore rapid initial drying to lose the first 15% moisture will reduce loss of starches and sugars and preserve more total digestible nutrients in the harvested forage. This initial moisture loss is not affected by conditioning.

The second phase of drying (II) is moisture loss from both the leaf surface (stomates have closed) and from the stem. At this stage conditioning can help increase drying rate, especially on the lower end.

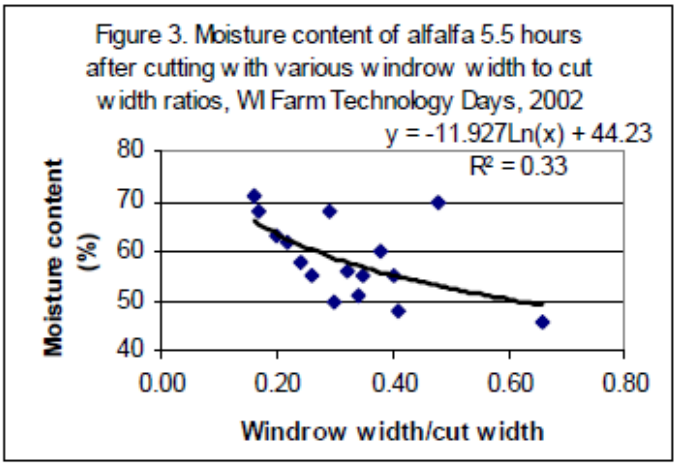
The final phase of drying (III) is the loss of more tightly held water, particularly from the stems. Conditioning is critical to enhance drying during this phase. Conditioning to break stems every two inches allows more opportunities for water loss since little water loss will occur through the waxy cuticle of the stem.



Understanding these principles will allow us to develop management practices in the field that maximize drying rate and TDN of the harvested forage. **The first concept is that a wide swath immediately after cutting is the single most important factor** maximizing initial drying rate and preserving of starches and sugars. In a trial at the UW Arlington Research Station (Figure 2) where alfalfa was put into a wide swath, it reached 65% moisture in about 8 hours and could be harvested for haylage the same day as cutting. The same forage from the same fields put into a narrow windrow was not ready to be harvested until late in the day or the next day!

In fact, **a wide swath may be more important than conditioning for haylage**.

The importance of a wide swath is supported from drying measurements taken at the Wisconsin Farm Technology Days in 2002 (figure 3) where different mower-conditioners mowed and conditioned strips of alfalfa and put the cut forage in windrow widths of the operators choice. Moisture content of the alfalfa was measured 5.5 hours after mowing. Each point is a different machine that included sickle bar and disc mowers and conditioners with, steel, rubber or combination rollers. Across all mower types and designs, the most significant factor in drying rate was the width of the windrow.



In figure 3, note the one outlying point at 70% moisture content and a windrow width/cut width ratio of 0.48. This shows how much drying can be slowed by improper adjustment of the conditioner.

We used to make wide swaths in the past but have gradually gone to making windrows that are smaller and smaller percentages of the cut area as mowers have increased in size. Generally, as mowers have gotten bigger, the conditioner has stayed the same size, resulting in narrower windrows. There is some variation among makes and models and growers should look for those machines that make the widest swath.

Putting alfalfa into wide swaths (72% of cut width) immediately after cutting results improved quality of alfalfa haylage compared to narrow windrows (25% of cut width) in studies at UW Arlington and Marshfield Research Stations in 2005 to 2007 (Table 1). Alfalfa was mowed with a discbine, conditioned, and forage was sampled approximately two months after ensiling in tubes. The alfalfa from the wide swaths had 1.0% less NDF, and 1.7% more NFC. Haylage from the wide swath had more substrate for fermentation which resulted in more lactic and acetic acid. The higher acid content would indicate less rapid spoilage on feedout.

Difference in composition of alfalfa haylage made from narrow and wide swaths after ensiling, 8 trials, UW Arlington & Marshfield, 2005-2007

Factor	Wide – Narrow Swath Difference
Hours to dry to 65% moisture	-10.8
Crude Protein, %	0.5
NDF, %	-1.0
NFC, %	1.7
Ash, %	-0..2
Lactic acid, %	0.8
Acetic Acid, %	-0.2
Relative Forage Quality	11

Some are concerned that driving over a swath will increase soil (ash) content in the forage. In table 1, the ash content of haylage from wide swath alfalfa was actually less than from narrow windrows. While narrow windrows are not usually driven over, they tend to sag to the ground causing soil to be included with the windrow when it is picked up. Wide swaths tend to lay on top of the cut stubble and stay off the ground. Further, driving on the swath can be minimized by driving one wheel on the area between swaths and one near the middle of the swath where cut forage is thinner.

Grasses, especially if no stems are present, must be into a wide swath when cut. When put into a windrow at cutting, the forage will settle together, dry very slowly and be difficult to loosen up to increase drying rate.

Recommendations:

1) Put cut forage into a wide swath at cutting that covers at least 70% of the cut area.

2) For Haylage: if drying conditions are good, rake multiple swaths into a windrow just before chopping (usually 5 to 7 hours later).

3) For Hay: if drying conditions are good, merge/rake multiple swaths into a windrow the next morning after mowing (when forage is 40 to 60 % moisture) to avoid leaf loss.

Adjusting the Conditioning System on a Mower-Conditioner
December 29, 2006

Ronald T. Schuler, Professor Extension Agricultural Engineer Biological Systems Engineering University of Wisconsin-Madison

To be effective, the conditioning system on a mower-conditioner must be properly adjusted to insure rapid drying of forage in the field. Rapid drying maintains the quality of the forage and reduces the risk of windrow losses and crop damage due to precipitation. Two types of conditioning systems used on mower-conditioners are roll and impeller. The primary adjustments for the conditioning rolls are roll spacing, roll pressure and timing. For the impeller type conditioner, the position of a deflection shield above the impeller determines the degree of crop conditioning. As crop conditions change, adjustment must be made to continue to maintain the effectiveness of the conditioning.

The conditioning roll clearance and pressure must be adjusted to insure the stems are cracked which increases the drying rate of the stems. Since the stems dry slower than the leaves, the stem cracking is the important indicator of proper conditioning. At least ninety percent of the stems should be cracked.

Another method of checking roll adjustment is to measure the clearance, which should be between 1/16 and 3/32 inch. When the crop is high yielding and has thick stems, the 3/32 inch adjustment would be most appropriate. For low yield cuttings and fine stems, the 1/16 should be considered. See the procedure developed by K. J. Shinners at the end of this article for one method of determining the roll spacing, especially for corrugated rolls. The machine operator must be mindful of the forward speed that also impacts the thickness of the forage mat passing through the roll conditioner. Forage mat thickness is less at slower forward speeds.

Machine operators should also check operator's manual for proper adjustment of the conditioning rolls. In one case the manufacturer recommends adjusting the clearance with the machine operating at slow PTO speed while tractor and machine are stationary. They suggest reducing the roll clearance until vibration and/or noise occur and then increasing the roll spacing to a specified point beyond where vibration and/or noise are eliminated. Most machines will have an adjustment at each end of the rolls.

The roll pressure also needs to be sufficient to crack the stems. For high yielding crops, creating a thicker mat of forage moving through the rolls, higher pressures are required. Excessive pressure can cause undesirable leaf loss. Spring tension is adjusted to change the roll pressure.

On impeller conditioning systems, the conditioning is due the rubbing or abrasion caused by the impeller fingers. Most of these machines have an adjustable deflector above the impeller which influences the degree of contact between the forage and impeller. When adjusting the deflector down, the degree of forage conditioning will increase. Nearly all the harvested stems should exhibit some mechanical abrasion caused by the impeller blades.

These mower-conditioner adjustments will reduce the risk of poor quality forage. Any steps that reduce the drying time are very important to harvesting high quality forages in Wisconsin weather conditions.

Following is from: Shinners, K. J. 2002 Getting the Most from a Mower-Conditioner. Presented at the 2002 Wisconsin Forage Symposium.

MEASURING ROLL CLEARANCE ON MOWER-CONDITIONERS

TO SAFELY CONDUCT THIS PROCEDURE YOU MUST:

- **SHUT OFF THE TRACTOR ENGINE**
- **ON MECHANICALLY DRIVEN UNITS: DISCONNECT THE MOWER-CONDITIONER PTO FROM THE TRACTOR PTO**
- **ON HYDRAULICALLY DRIVEN UNITS: DISCONNECT THE MOWER-CONDITIONER PTO HYDRAULIC PUMP FROM THE TRACTOR PTO**
- **LOWER THE CUTTING PLATFORM**

This procedure can be used to determine the roll clearance on most roll type mower-conditioners. The owner's manual of most mower-conditioners will have the proper clearance and the correct procedure for making this adjustment. Generally, the roll clearance should be in the range of 0.060 ($^1/_{16}$) to 0.090 ($^3/_{32}$) inches. If the clearance is less than this range, excess leaf loss and roll wear can occur. If the clearance is significantly more than this range, then the crop will not be conditioned as effectively and slower drying rates can be expected.

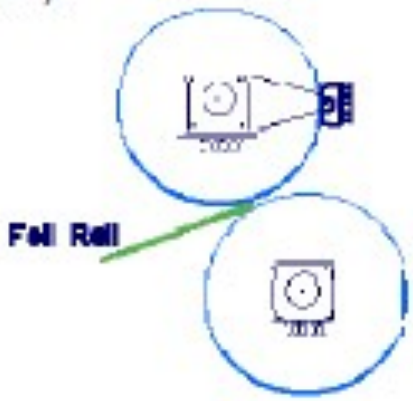
PROCEDURE

1. Cut three (3) pieces of typical household aluminum foil 18 inches in length. The foil strips should be at least 12 inches wide.

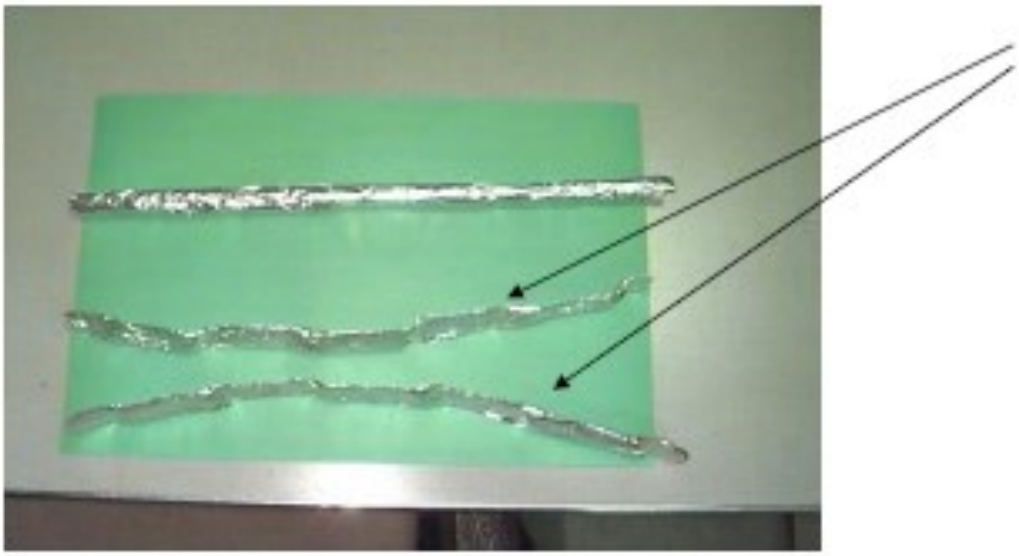
2. Using each strip individually, form three (3) separate rolls by wrapping a foil strip around a mandrel of rod, pipe or dowel that is 0.375 ($^3/_8$) inches in diameter. Slide the roll off the mandrel taking care not to crush the foil roll.

3. Place one foil roll in the approximate center of the conditioning rolls and the remaining two foil rolls about 1 foot from each end of the conditioning rolls.

The foil rolls should be placed perpendicular to the roll longitudinal axis (see below).



4. Make sure the cutting platform is fully lowered. This is the only safe way to make this measurement, plus on some mower-conditioners, raising the platform also opens and separates the rolls preventing an accurate measure of the minimum roll clearance.
5. Turn the rolls over by hand until the foil rolls come completely through the rolls.



6. The rolls will crush the foil rolls and the minimum roll clearance can be determined by using a digital or dial caliper to measure the thickness of the foil roll. A low-cost digital caliper (~$40) can be found at Techni-Tool (Part No. 575GA103, 1-800-832-4866). Take several measurements of the thickness along the length of each foil roll and determine an overall average. The measurement should be taken where the "crimp" or smallest clearance occurs as noted in the above figure.