Extension
UNIVERSITY OF WISCONSIN–MADISON
CALUMET COUNTY

Agriculture Newsletter

May 2021

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Calumet County Courthouse
working remotely and Room #018A
206 Court Street
Chilton, WI 53014

Happy (almost) Planting Season!

Did you know that Calumet County's local Forage Council takes alfalfa samples across the county on multiple days leading up to first cutting hay to help you determine the optimum cut time? Those results are sent out via email (if subscribed to Extension's Ag E Newsletter) and posted at https://calumet.extension.wisc.edu/agriculture/alfalfa-hotline/.

This, along with corn silage dry downs come harvest time, is one of the helpful services that the Calumet County Forage Council offers to farms across the county at no cost. If you use any of the Forage Council's services or are interested in supporting the local council, please see page 9 for the registration form. Membership is only $15 for the local council, and $45 for MFA membership, which includes money saving coupons, Forage Focus magazine, and other benefits. Both membership forms are included in this newsletter.

Amber O'Brien

Table of Contents

Save the Dates

Sundae on the Farm
Host: Woldt Farms
Sunday, June 27, 2021

Eastern Wisconsin Farm Management Update
Friday, May, 21, 2021
Virtual Format

Calumet County Public COVID-19 Vaccine Clinic

Calumet County, in partnership with Ascension Calumet and St. Martin Lutheran Church, currently offers a public vaccination clinic. The site is located across from Ascension Calumet Hospital in Chilton. Parking for the vaccination clinic is accessible from Oak Street and located behind the church. The Clinic is open Tuesdays, Wednesdays, and Fridays (dependent on the availability of vaccine doses).

Clinic Location:

St. Martin Lutheran Church, 717 Memorial Drive, Chilton

Eligible Groups:

All individuals, age 16 and older

- *Pfizer-BioNTech Vaccine

Appointment Registration:

Appointments are required and walk-ins WILL NOT be accepted at the clinic. Registration is open to the public every Monday at 10:00 a.m. and will remain open until all time slots for that week are full.

Register Online:

- Visit www.calumetcounty.org/COVID-19
- Click the registration button at the top of the page and complete all steps in the form.
- The registration button will only be displayed when appointments are available and will be taken down once all openings are filled for the week.

Alternative Registration:

- Call (920) 849-1466 and a Calumet County staff member will assist you in registering, if available.

Extension
UNIVERSITY OF WISCONSIN-MADISON
OUTAGAMIE COUNTY

Determining the Value of Standing Alfalfa in 2021

Kevin Jarek - UW-Madison, Division of Extension, Crops and Soils Agent - Outagamie County

The "fair" value of any given alfalfa stand can vary tremendously. The absence of daily quotes as compared to other agricultural commodities (grains) requires us to rely on the most recent hay market prices available at https://fyi.extension.wisc.edu/forage/h-m-r/. The three most significant factors to consider when determining the potential value for any individual cutting of alfalfa or the stand for the entire growing season include:

A) **Expected Dry Matter (DM) Yield in Tons per Acre** B) **Estimated Value of a Ton of DM** C) **Harvesting Costs**

Ideally, one would be able to weigh the forage being harvested from any individual cutting from a particular field. This is the best way to ensure that both parties are treated equally in any formal arrangement in which standing alfalfa is bought or sold. If a scale is available, multiple forage samples should be collected during the process of harvesting to determine an accurate value for the average dry matter (DM) content of the feed being sold. Once you have agreed upon a fair price or value for a ton of DM (may be with or without harvesting costs), you simply multiply the harvested tonnage by the agreed upon value per DM ton then adjust for harvesting costs if they were not already taken into consideration. Unfortunately, not all farms have access to drive-over scales or state-certified scales at harvest.

Expected Dry Matter (DM) yield can be estimated by measuring alfalfa stand density as illustrated below or by utilizing multi-year data from the Wisconsin Alfalfa Yield and Persistence (WAYP) program managed by the University of Wisconsin-Madison and Division of Extension. The 2020 WAYP project summary can be downloaded for review at: https://fyi.extension.wisc.edu/forage/files/2021/03/2020-WAYP-Summary.pdf.

1) **Stand Density**: Alfalfa stands with an **average of 55 stems per square foot** are defined as not being limited and having full season yield potential. Due to the high variability in alfalfa stem counts throughout many fields these past few growing seasons, it would be wise for buyers and sellers to evaluate stands to determine a realistic potential yield before a sale is agreed upon. WAYP project data can help you estimate DM yield derived from on-farm data collected over the past 14 years. Local growing conditions, alfalfa stand condition after overwintering, age of the stand, composition of the stand, soil texture/series, soil fertility, and soil drainage can all significantly impact alfalfa DM yields during any given growing season. It is not advisable to purchase standing alfalfa without taking each of these considerations into account before any final arrangement is agreed upon by all parties involved.

stand density (stems/sq ft)	action
>55	stem density not limiting yield
40–55	some yield reduction expected
<39	consider replacing stand

Source: Alfalfa Stand Assessment – Is This Stand Good Enough to Keep? – Dan Undersander, Forage Agronomist, UW-Madison

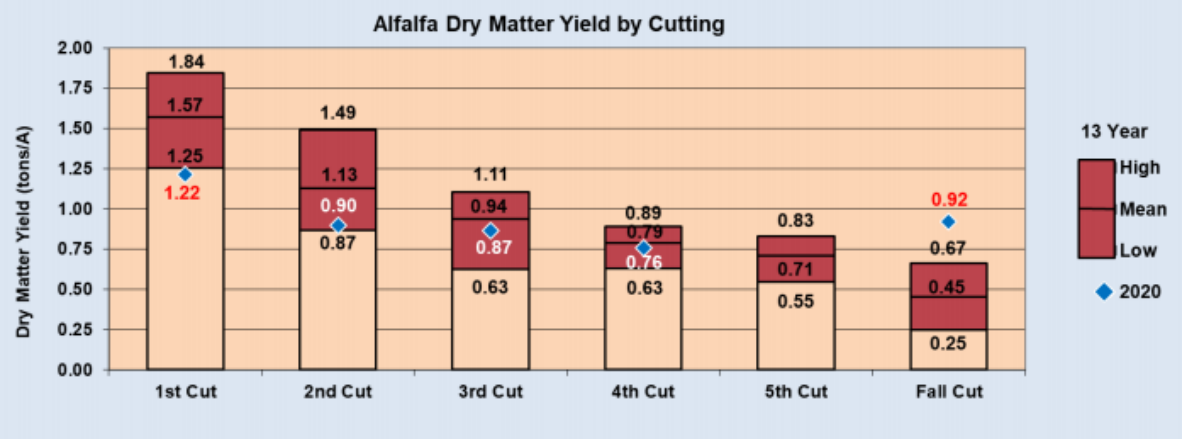
2) **Percentage of Overall Season Yield Per Cutting as Determined by the WAYP Program On-Farm Data:**

3 cut system – **46%** (1st crop) – **28%** (2nd crop) – **26%** (3rd crop)

4 cut system – **36%** (1st crop) – **25%** (2nd crop) – **21%** (3rd crop) – **18%** (4th crop)

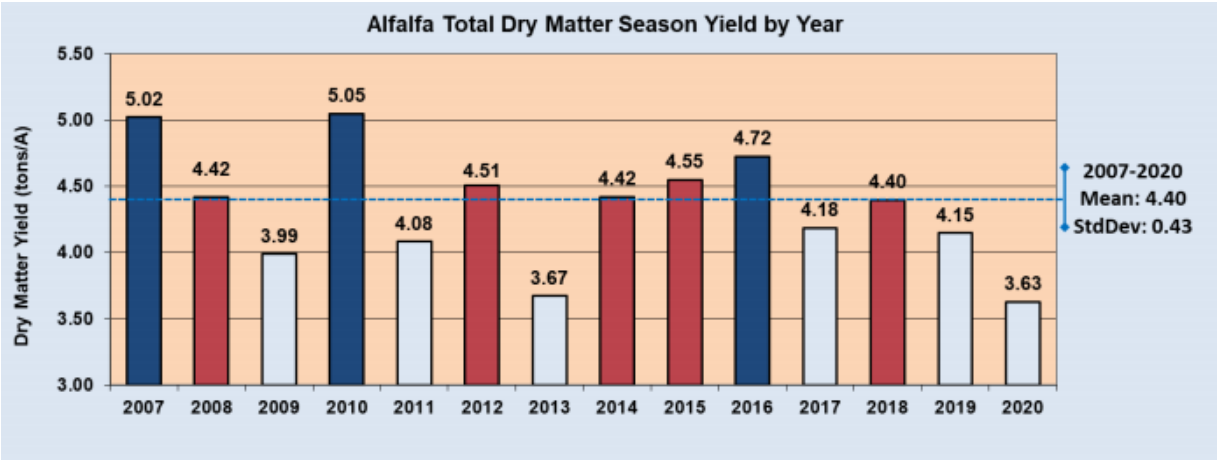
5 cut system – **31%** (1st crop) – **23%** (2nd crop) – **18%** (3rd crop) – **16%** (4th crop) – **12%** (5th crop)

WAYP data collection began with the first full production year following new seeding. Fifth crop data was collected and included in years when a fifth cutting was available. It should be noted that four-cut systems represent the largest percentage of the data. The low, mean (average), and high values for DM yield over the life of the project are illustrated below. In addition, 2020 data is included so you can compare the most recent year's data to the other benchmark measurements established over the past 14 years. As illustrated below, 2020 was not a particularly good year for yield with each of the four cuttings coming in below the project mean. Also of note, we set a new record low yield for first cutting in 2020 which has contributed to the lower than expected forage inventories in some parts of the state as we head into the 2021 growing season.



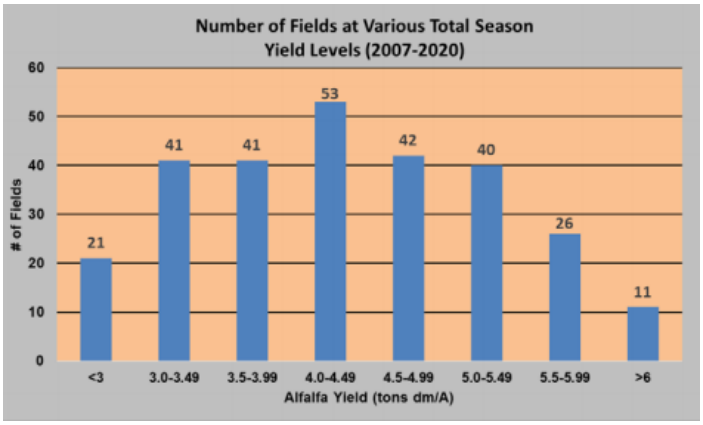
Source: Wisconsin Alfalfa Yield and Persistence (WAYP) Program Summary, 2020

3) **Total Season Yield**: The WAYP program has an observed yield range of less than 3.0 tons to more than 6.0 tons DM per acre. The most frequently observed yield has been **4.0-4.49 Tons per DM per Year**. The following chart illustrates the annually observed mean of alfalfa DM yield in tons per acre from 2007-2020. The average yield of first through fourth crops over the project is 4.40 tons DM per acre.

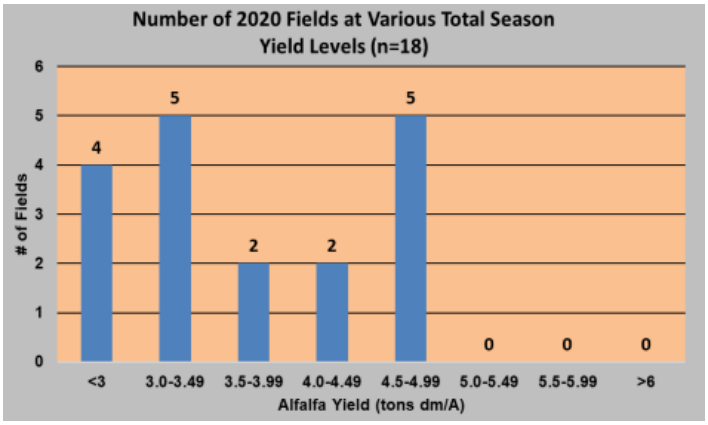


Source: Wisconsin Alfalfa Yield and Persistence (WAYP) Program Summary, 2020

Dry Matter Yield Level Distribution from 2007-2020



Dry Matter Yield Distribution 2020 Growing Season



Source: Wisconsin Alfalfa Yield and Persistence (WAYP) Program Summary, 2020

4) **Weather Risk and Field Losses**: Management practices applied to the site by the buyer during the cutting and harvesting of alfalfa will influence the final quality measurements. Purchased baled hay may have a known, measured quality indicator like Relative Forage Quality (RFQ) or Relative Feed Value (RFV). Alfalfa purchased from the field has an unstable quality complex as weather risk, insect or disease pressure, advancing maturity, leaf shatter, and harvesting losses need to be considered and accounted for when determining the final price. An adjustment of 25 percent to the value of the alfalfa standing in the field may be considered a reasonable method to further account for the buyer's risk.

5) **Determining the Value of a Ton of DM Alfalfa**

Hay Market Demand and Price Reports for the Upper Midwest are located on the UW-Madison, Division of Extension, Team Forage (http://fyi.uwex.edu/forage/) website with updates located at https://fyi.extension.wisc.edu/forage/h-m-r/. The most recent report (April 12, 2021) indicates large square bales of Prime Quality (>151 RFV/RFQ) alfalfa averaged $205 per ton. The value of a ton of DM is determined via the following calculations:

Price for a Ton of DM

As baled hay, assume moisture of 15 percent which means it is 85 percent DM or **0.85 DM**

$205.00	**X**	as fed ton	=	**$241.18**
as fed ton		**0.85 ton DM**		Ton DM

When is the last time you successfully harvested all your alfalfa without any weather damage? One may harvest four high quality cuttings, or one may harvest four lower quality cuttings. Earlier we identified the difference between purchasing alfalfa that has already been harvested. It is a know quality. Standing alfalfa must be adjusted for both field losses and potential weather risk, both of which can significantly impact the quality of the harvested forage. **The buyer and seller can decide if they wish to use a factor other than 25%.**

If we use $241.18 per ton DM and apply a 25% risk adjustment, we end up with a risk adjusted value for ton of DM standing alfalfa as follows: ($241.18 X 0.25 = $60.30), $241.18 - $60.30 = **$180.88 per ton of DM**.

6) **Harvesting Cost**: Based on the most recent costs posted in the **Wisconsin Custom Rate Guide 2017** https://www.nass.usda.gov/Statistics_by_State/Wisconsin/Publications/WI-CRate17.pdf or **2021 Iowa Farm Custom Rate Survey** https://www.extension.iastate.edu/agdm/crops/pdf/a3-10.pdf one would expect to pay the following for the field operations identified below:

Mowing and Conditioning per acre:	***Windrow Merging per acre:***	***Chopping, Hauling, and Filling Upright Silos and *Bunker Silos per acre***
$5-$50 per acre, $14.20 statewide average (WI - 2017)	$3-$40 per acre, $11.60 statewide average (WI - 2017)	Pull-Type Forage Harvester $15.00-$60.00 per acre, $41.30 statewide average (WI - 2017)
$12-$20 per acre, $15.15 statewide average (IA - 2021)	$9-$18 per acre, $14.50 statewide average (IA - 2021)	Self-Propelled Forage Harvester $40.50 - $70.00 per acre, $52.20 statewide average (WI - 2017)
		*Self-Propelled Forage Harvester $23.30 - $65.00 per acre, $49.20 statewide average (WI - 2017)

Using values cited earlier, one may spend $15 per acre cutting and conditioning the alfalfa, $14 per acre merging the alfalfa, and $47.57 per acre (average between pull type and self-propelled units - **adjust your costs as needed**) chopping, hauling, and filling an upright silo or a bunker silo resulting in $76.57 per acre invested for each cutting. **One's harvesting costs may be higher or lower than those cited here**; however, this is what is used for this example. If one harvests four (4) cuttings, total harvest costs are $306.28/acre for the season ($76.57 X 4 cuttings = $306.28). **If the buyer's harvesting costs are less, one can adjust downward. If the buyer's harvesting costs are higher, one can adjust upward.** While the landowner who established the alfalfa has the expense of the land, taxes, seed, chemical, and fertilizer, the buyer not only has the harvesting costs, but assumes the risk of field losses and weather damage exceeding the 25 percent quality adjustment discussed earlier.

Once one has calculated or agreed upon the value of a ton of DM and has made a reasonable yield estimate, one may proceed. In this first example we used a 4.0-ton DM yield for the season at a value of $180.88 per ton DM. Four (4) tons of DM X $180.88 per ton DM = a final harvested value of $723.52. After we deduct the cost of harvesting $306.28, (4 cuts X $76.57), we are left with the following:

Harvesting **4.0 tons of DM** total value would be $723.52 less harvesting costs of $306.28 = **$417.24 residual**

1st Cutting = $ 417.24 X 36% of total yield (1.44 tons DM) for the season = $150.21
2nd Cutting =$ 417.24 X 25% of total yield (1.00 tons DM) for the season = $104.31
3rd Cutting = $ 417.24 X 21% of total yield (0.84 tons DM) for the season = $ 87.62
4th Cutting = $ 417.24 X 18% of total yield (0.72 tons DM) for the season = $ 75.10

Harvesting **4.5 tons of DM** total value would be $813.96 less harvesting costs of $306.28 = **$507.68 residual**

1st Cutting = $ 507.68 X 36% of total yield (1.62 tons DM) for the season = $182.76
2nd Cutting = $ 507.68 X 25% of total yield (1.13 tons DM) for the season = $126.92
3rd Cutting = $ 507.68 X 21% of total yield (0.95 tons DM) for the season = $106.61
4th Cutting = $ 507.68 X 18% of total yield (0.81 tons DM) for the season = $ 91.38

Harvesting **5.0 tons of DM** total value would be $904.40 less harvesting costs of $306.28 = **$598.12 residual**

1st Cutting = $ 598.12 X 36% of total yield (1.80 tons DM) for the season = $215.32
2nd Cutting = $ 598.12 X 25% of total yield (1.25 tons DM) for the season = $149.53
3rd Cutting = $ 598.12 X 21% of total yield (1.05 tons DM) for the season = $125.60
4th Cutting = $ 598.12 X 18% of total yield (0.90 tons DM) for the season = $107.66

Summary

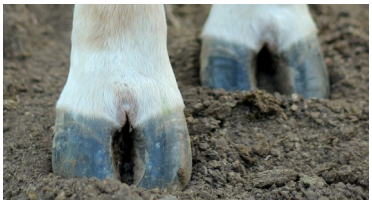
When a drive-over or state-certified scale is not available to measure yield, purchasing alfalfa by the cutting or by the acre may be difficult given the widespread variability in fields in 2021. Focusing time and effort on the three most significant considerations when determining the value of standing alfalfa can help. The buyer needs to estimate as accurately as possible what the potential DM yield may be, and the seller needs to account for reasonable harvesting costs associated with getting the crop out of the field. As discussed earlier, the best option is always to weigh the crop as it is harvested and adjust for DM. However, if that is not an option, walking the fields, estimating stems counts per sq. ft., and assessing overall plant health may help all parties involved arrive at a fair value and avoid later conflict.

Additional Methods for Determining the Value of Alfalfa – Is There an App for That?

Additional methods to calculate the value of standing alfalfa include an app that can be downloaded for **free** at https://play.google.com/store/apps/details?id=com.smartmappsconsulting.haypricing. Those with iPhones and iPads can download the app from the Apple Store by searching "Hay Pricing".

April 2021

Walking Strong:
A Hoof Health Webinar Series



When it comes to health issues on a dairy farm, lameness is usually a main concern along with mastitis and reproductive issues. Lameness includes any abnormality which causes a cow to change the way she walks. It can be caused by a range of foot and leg conditions including foot rot, digital dermatitis, laminitis, and claw disease. Lameness can be influenced by nutrition, disease, genetic influences, management, and environmental factors. Not only does lameness cause pain and distress for dairy cattle, but it also has a large economic impact on the dairy operation. Walking Strong is a three-webinar series for dairy workers. Two webinars will be offered in Spanish and one in English. Join us on **Tuesdays, May 11, 18, and 25**, 2:00 pm to 3:30 pm, to learn more about infectious claw diseases.

UW-Madison School of Veterinary Medicine Associate Professor Dorte Dopfer, PhD, DVM, will be joining the series for all three webinars. Dr. Dopfer specializes in bovine lameness and the epidemiology of digital dermatitis (hairy heel warts) which leads to her research about best-practices for footbaths to prevent and control digital dermatitis in cattle. Extension educators Maria Jose Fuenzalida, Aerica Bjurstrom, and Tina Kohlman are also included on the agenda.

Three-webinar series:

- May 11, 2021 from 2:00-3:30 pm (offered in Spanish) focusing on "Prevention and Control of Infectious Claw Diseases" with UW Madison School of Veterinary Medicine Associate Professor Dorte Dopfer and "Keeping Yourself Safe While Working with Cows' Feet" with Extension Dane County Dairy and Livestock Educator Maria Jose Fuenzalida.
- May 18, 2021 from 2:00-3:30 pm (offered in English) focusing on "Prevention of Infectious Claw Diseases in Robotic Farms" with UW Madison School of Veterinary Medicine Associate Professor Dorte Dopfer and "How to Manage a Footbath" with Extension Kewaunee County Agriculture Agent Aerica Bjurstrom.
- May 25, 2021 from 2:00-3:30 pm (offered in Spanish) focusing on "Prevention and Control of Digital Dermatitis in Heifers" with UW Madison School of Veterinary Medicine Associate Professor Dorte Dopfer and "The Impact of Facilities and Management on Heifer Hoof Health" with Extension Fond du Lac County Dairy & Livestock Agent Tina Kohlman.

There is no fee for this program; however, pre-registration is required. To register for these webinars, please visit:

- May 11 https://go.wisc.edu/4uo8h5
- May 18 https://go.wisc.edu/77698m
- May 25 https://go.wisc.edu/tf8925

This program has been organized by UW Madison Extension Dairy Program Team Members Aerica Bjurstrom, Tina Kohlman, and Maria Jose Fuenzalida. Generous financial support is provided by Diamond V.

If you need assistance, please contact Extension Dane County Dairy & Livestock Educator Maria Jose Fuenzalida at (608) 224 3708 or maria.fuenzalidavalenzuela@wisc.edu.

2021 Calumet County
Forage Council Membership Application

Name _____

Farm/Business Name _____

Address _____

City, State, Zip _____

Phone _____

Email _____

Local Council _____Calumet_____

(check one) Producer_____ Educational_____ Other _____

Registration and Membership Payment Choices:

(check all that apply)

____ I have paid my MFA dues directly to the Midwest Forage Association

____ Midwest Forage Association Membership Dues..... @ $45.00 _____

____ Calumet County Forage Council Membership..... @ $15.00 _____

____ Donation to the Calumet County Forage Council ..... _____

Total Amount Enclosed..... $_____

Make check payable to *Calumet County Forage Council*

Mail check and application form to:

Jeremy Hanson
CCFC Treasurer
1138 E. Capitol Drive
Appleton, WI 54911

or

Amber O'Brien
Extension Calumet County
206 Court Street
Chilton, WI 53014

Hay Market Demand and Price Report for the Upper Midwest For April 12, 2021

Data Compiled by Richard Halopka Senior Outreach Specialist
UW-Madison Division of Extension Clark County Crops & Soils Educator

Upper Midwest Hay Price Summary by Quality Grade

Hay Grade	*Bale type*	*---------- Price ($/ton) ----------*		
		Average	Minimum	Maximum
Prime (> 151 RFV/RFQ)	Small Square	$223.00	$135.00	$300.00
	Large Square	$205.00	$120.00	$290.00
	Large Round	$155.00	$125.00	$175.00
Grade 1 (125 to 150 RFV/RFQ)	Small Square	$162.00	$120.00	$224.00
	Large Square	$162.00	$100.00	$220.00
	Large Round	$135.00	$100.00	$160.00
Grade 2 (103 to 124 RFV/RFQ)	Small Square	$115.00	$115.00	$115.00
	Large Square	$125.00	$85.00	$150.00
	Large Round	$104.00	$50.00	$125.00
Grade 3 (87 to 102 RFV/RFQ)	Small Square		No Reported Sales	
	Large Square	$104.00	$80.00	$130.00
	Large Round	$63.00	$44.00	$105.00

2021
Midwest Forage Association/ Calumet County Forage Council
Membership Form

Don't miss out
on your MFA benefits...
JOIN NOW!

Benefits Waiting for You!

Forage Focus!
MFA's magazine, is packed with featured articles on commercial hay, corn silage, equine, beef, dairy, grazing, equipment and forage research. Each issue also offers insight from a leading forage producer.

Clippings!
MFA's electronic newsletter, contains current forage news and an events calendar.

www.midwestforage.org!
MFA's producer-inspired website, features members only classifieds, hay pricing and quality information and a research database.

Access to legislators and agency officials!
MFA will be a leader in policy issues impacting our forage industry.

Field days, workshops, and conferences!
MFA offers access to university forage researchers, industry representatives and leading agricultural producers.

RFV PEAQ sticks!
A simple and effective tool to schedule your harvest and to achieve forage quality target levels, are available through the MFA office.

MFA is committed to Local Councils!
MFA has 15 local councils that add support to the local level.

Money-saving Coupons!
*Get your membership "**free**"!*
Recoup your MFA membership by redeeming valuable coupons, There are 18 coupons for 2021!

What has MFA been up to?

Building local council relationships
Heightening forage visibility in Washington D.C.
Providing educational research opportunities
Publishing a producer-focused magazine, Forage Focus!
Networking at local, regional, and national Levels

WORKING FOR YOU!

Name: _____

Farm/Business Name: _____

Address: _____

City, State, Zip: _____

Phone: _____

Email: _____

County: _____

Local Council: _____

Check One:

☐ Agency
☐ Industry
Circle:
Ag Lenders
Crop Protection Tools
Equipment
Insurance
Nutrition
Seed
Other: _____

☐ Extension/University
☐ Producer
Circle:
Beef
Commercial Hay
Dairy
Equine
Other: _____

☐ Other: _____

2021 Membership	$ 50.00
Less $5.00 local council subsidy	- 5.00
Total Enclosed	**$** _____

Return Membership Form and Payment to:

Midwest Forage Association
4630 Churchill Street, #1
St. Paul, MN 55126
mfa@midwestforage.org
www.midwestforage.org

Paycheck Protection Program

SBA is **currently offering PPP loans until May 31, 2021**.

The Paycheck Protection Program (PPP) provides loans to businesses to keep their workforce employed during the Coronavirus (COVID-19) crisis. Farmers are eligible for PPP loans through the Small Business Administration (SBA), if they have fewer than 500 employees. Borrowers may be eligible for PPP Loan Forgiveness if certain conditions are met.

The PPP loans are facilitated through participating lending institutions with established SBA relationships. Farmers can also work with the Farm Credit Service organization that services their geographic area. Some lenders and Farm Credit Services are limiting their PPP lending to businesses with whom they have existing relationships. The SBA offers a map and search function for those seeking a PPP loan and looking for eligible PPP lenders. After reviewing the eligibility criteria below, **the first recommendation is for farmers to call their current lender(s) to see if they have that SBA relationship and ask if they are accepting PPP applications**. Be sure to inquire if the lender has their own loan restrictions, application form and documentation requirements.

Visit SBA's website: "COVID-19 Economic Injury Disaster Loans" at https://farms.extension.wisc.edu/ppp-and-eidl-loans-advances-what-farmers-should-know/ for more information.

Economic Injury Disaster Loan Program

The Economic Injury Disaster Loan (EIDL) purpose is to meet financial obligations and operating expenses that could not have been met had the disaster not occurred. These are loans that the borrower makes an application directly to the SBA.

While the EIDL ***Advance*** funding has all been distributed, the EIDL COVID-19 loan program is still open for applications. The online application is available at address: https://covid19relief.sba.gov/#/

To be eligible for an EIDL, a business must have 500 or fewer employees and have been in operation by January 31, 2020. The following types of business are eligible for EIDL:

- Sole proprietorships, with or without employees,
- Independent contractors, with or without employees,
- Cooperatives,
- Employee owned businesses,
- Tribal small businesses,
- Private non-profit that has tax exemptions under 501 (c), (d) or (e).

The SBA EIDL COVID-19 loans amounts are for six months of working capital, up to a maximum of $150,000. The interest rate is 3.75% for businesses and 2.75% for non-profits. Maximum loan term is 30 years. The emergency **loans** are not forgiven (except for emergency advances).

Visit SBA's website: "COVID-19 Economic Injury Disaster Loans" at https://farms.extension.wisc.edu/ppp-and-eidl-loans-advances-what-farmers-should-know/ for more information.

Strategies and Considerations for Termination of Cereal Rye Cover Crop

by Rodrigo Werle (UW-Madison Extension Cropping Systems Weed Scientist), Dan Smith (UW NPM Southwest Wisconsin Regional Specialist) and Shawn Conley (UW-Madison Extension Soybean and Small Grain Specialist)

*Adapted from original article written by Rodrigo Werle and Dan Smith, 2018.

Fall-planted cereal rye is increasingly used as a cover crop to protect the soil during winter and spring in corn and soybean cropping systems across the Midwest. Our **2018 survey** indicated that 77% of Wisconsin farmers and Ag professionals are interested in cover crops.

Fall-planted cereal rye is awakening and will start growing rapidly in southern Wisconsin; thus, it's important to have a termination plan in mind prior to crop establishment. The following pictures demonstrate the rapid cereal rye growth during a 10-day interval in the spring of 2018:

Figure 1. Picture of a cereal rye cover crop field in south-central Wisconsin taken on April 30, 2018.

Figure 2. Picture of the same cereal rye cover crop field in south-central Wisconsin taken on May 10, 2018.

Cereal Rye Cover Crop Termination Strategies Herbicides

Research conducted in Missouri showed that 28 fl oz of Roundup (glyphosate) provided satisfactory control of cereal rye (Figure 3). The early termination treatment (early-April) resulted in slightly better control than the later termination treatment (early-May). Glyphosate efficacy decreases when plants reach reproductive stages. The contact herbicide Gramoxone was also tested and was not as effective as glyphosate.

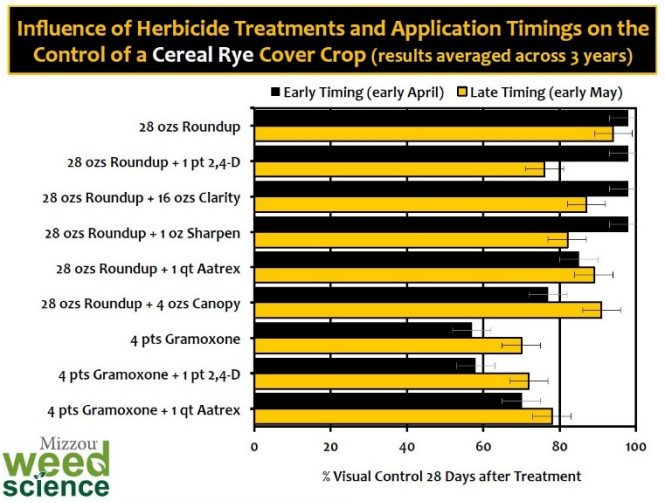


Figure 3. Influence of herbicide treatments and application timings on the control of cereal rye cover crop (results averaged across 3 years of research in Missouri). Data collected by Dr. Kevin Bradley's research group at the University of Missouri.

Research conducted in Wisconsin also demonstrated that glyphosate provided successful termination of cereal rye (see: **Termination of winter rye and annual ryegrass using glyphosate**).

Roller-Crimper

According to research conducted in Pennsylvania, roller-crimpers can be used effectively for cereal rye termination after the boot stage (Figure 4). Although not widely used across the Midwest, the use of roller-crimpers is a viable strategy for producers that would like to have additional biomass in the spring before crop planting and use a mechanical strategy for cover crop termination rather than herbicides.

Figure 4. Roller-crimper rolling down cereal rye cover crop in Pennsylvania. Picture obtained from the USDA Integrated Weed Management Resource Center Website.

For additional information on roller-crimpers, watch the video: **Advances using the roller-crimper for organic no-till in Wisconsin**.

Cereal Rye Cover Crop Termination Considerations

- If glyphosate is used for cereal rye termination, it should be sprayed when day temperatures are above 55° F and night temperatures are above 40° F. For more effective cereal rye control, glyphosate should be applied before the boot stage.
- Contact herbicides such as paraquat (e.g., Gramoxone) and glufosinate (e.g., Liberty, Cheetah, Scout, etc.) may be used for cereal rye termination; however, they may not provide adequate control if the cereal rye is at boot or later stages. As with any contact herbicide, practices to improve spray coverage will improve efficacy (e.g., medium spray droplet size and higher application rates [GPA]).
- If cereal rye will be harvested for forage, herbicides should be sprayed after biomass harvest and removal from the field to control the cereal rye regrowth.
- If a legume is part of the cover crop mix, using a growth regulator herbicide such as 2,4-D or dicamba will enhance termination (see planting restrictions prior to selecting a growth regulator for cover crop termination).
- If glyphosate-resistant weeds are established at cereal rye termination (e.g., marestail, giant ragweed), adding herbicides such as 2,4-D and/or saflufenacil (e.g., Sharpen) to the tank-mix will assist with their control (see label for planting restrictions).
- UW-Madison and other researchers across the Midwest recommend terminating cover crops before crop planting (see: **Cover Crops Do's and Don't's**).
- Late termination of cereal rye may reduce the yield potential of the main crop from excessive soil water use, temporary sequestration of plant available nutrients that are critical for the early development of the subsequent cash crop (particularly nitrogen for corn), and/or excessive amounts of residue that can difficult planting.
- Cover crops may suppress troublesome weeds, but typically do not provide complete weed control alone. Combining cover crops and herbicide programs (including PRE-emergence herbicides) can be a powerful strategy for weed management in conventional cropping systems.
- Cover crop residue may alter the fate of soil-applied PRE-emergence herbicides. Rainfall after application is necessary to move pre-emergence herbicides into the soil profile.
- Producers are encouraged to visit with their insurance provider when deciding the time for cover crop termination.

For additional information on herbicide options, check the **Pest Management in Wisconsin Field Crops** UWEX Bulletin A3646 (PDF). Always check the herbicide labels before application.

Identifying and Managing Soil Compaction in Field Crop Production

by Richard Wolkowski
UW-Madison, Division of Extension

Causes of Soil Compaction

The need to conduct field operations in a timely and efficient manner has renewed concerns regarding the "productivity robbing" effects of soil compaction. Today's farmer is managing greater numbers acres with the pressure to complete operations in a timely manner. Manure management and harvesting equipment, and even tractors are much larger than they were just a few years ago. Operations must often be conducted when soils are wet. These factors have become problematic on large dairy farms and other livestock operations where frequent and extensive manure application is necessary.

Typically, soils are 50% solid and 50% pore space, with about half of the pore space filled with water. Soils are most easily compacted when the water content soil is at, or just above, its field capacity. Pressure from wheel traffic and tillage consolidate the soil, first reducing the number and size of larger pores by re-arranging soil aggregates. Heavy loads can destroy the soil structure itself. The resulting soil has a greater density and lower porosity. Pores, especially the larger ones, are important for water and air movement. The potential for compaction increases as the soil clay content increases, however sandy soils can become compacted, especially if sand particles are of different sizes.

Bulk density, defined as the mass of soil per unit volume, is one measure of soil compaction. Table 1 shows the soil bulk density over three years following wheel-traffic compaction from a 14-ton vehicle. This field was compacted over its entire area in the spring and worked lightly prior to seeding alfalfa. The change in bulk density is visible well below the plow layer and is relatively unaffected over the three years. This suggests that compaction can occur in the subsoil and that its effects are long-term and are not quickly ameliorated by natural factors such as freezing and thawing or wetting and drying.

Diagnosing Compaction

The signs and symptoms of compaction can be found by examining the response of the soil and crops to wheel traffic. Compacted soils have imperfect drainage, resulting in ponding and increased runoff. Where the structure is destroyed, the soil will be massive and cloddy. A horizontal or platy type of structure can also develop in the upper soil layer. The loss of structure disrupts natural pores and channels important for water and air movement, and the resulting increase in soil strength impedes root proliferation.

Compaction effects are also exhibited in the growth of the plant. Uneven height growth is common where one appears normal and the adjacent plant is stunted. The root system will be malformed such that horizontal development occurs at the restrictive layer. Nutrient deficiencies, especially K, can develop in response to poorer aeration in the soil. Compaction almost always causes a loss in yield. The magnitude of the yield loss is often related to the incidence of water stress conditions during the growing season.

Table 1. Soil bulk density following compaction of a silt loam soil with a 14-ton vehicle, Arlington, Wis.

		Year 1	Year 2	Year 3
Depth (in.)	Compaction	---------- g/cc ----------		
0 – 6	No	1.19	1.3	1.32
	Yes	1.36	1.41	1.40
6 – 12	No	1.31	1.33	1.31
	Yes	1.59	1.5	1.52
12 – 18	No	1.29	1.35	1.33
	Yes	1.45	1.44	1.39
18 – 24	No	1.36	1.35	1.34
	Yes	1.40	1.34	1.33

Compacted by tracking 100% of area to times in April of year on. Field worked lightly with a disk and direct seeded to alfalfa.

A common assessment device is the penetrometer, a cone tipped rod attached to a gauge that is pushed into the soil at a constant rate. It measures the resistance to penetration and somewhat simulates the environment that a growing root would experience. Simple penetrometers are pushed by hand and have a dial that translates the force into green, yellow, and red zones. Advanced units are mechanically driven and have sensors that can be calibrated to measure and record the resistance in units of pressure. The soil water content will have a significant impact on the penetration resistance. It is recommended that measurements be taken when the soil is at its field moisture water content. Soil bulk density is a useful measurement of compaction and its measurement provides for the calculation of porosity. Most farmers or crop advisors do not have the appropriate tools to make this measurement.

There is no critical level of any soil measurement that universally identifies the degree of soil compaction that will result in a crop yield reduction. Penetration resistance, as previously indicated, is greatly affected by the soil water content and will obviously be very high if readings are taken in dry conditions. Bulk density is not affected by moisture, but is a function of soil texture. It is recommended that any measurement should be made to develop a relative comparison between areas where compaction is suspected and where it is unlikely. For example, compare a headland with an area in the main part of the field or a wheel-tracked area with a non-tracked area. It is often useful to excavate the soil to examine the soil structure and evaluate plant root distribution. Be sure to note the depth at which compaction occurs to determine the depth of the restrictive layer. Knowledge of the location and size of this layer will determine if deep tillage can remove the compaction.

Soil Compaction Research

The effect of compaction has been studied by this author at several locations in Wisconsin. Because compaction has such a profound effect on the soil tilth its effects are variable from year-to-year depending on weather conditions. A study was conducted on corn at Arlington from 1988-1990. This period included a drought year and two years that might be considered normal.

Table 2 shows the corn yield for those years and monthly total precipitation for June – August. Clearly, yield was reduced in the dry year. Yields were similar in the normal years if the soil wasn't compacted, but were drastically reduce in 1990 in the compacted plots. This reduction is likely the result of moisture stress caused by a reduced root system and the relatively low precipitation received in July when the corn was pollinating.

Table 2. June-August precipitation and the effect of soil compaction on yield, Arlington, WI, 1988-1990

	1988	1989	1990
Compaction	---------- bu/a ----------		
< 5 ton	129	167	172
14 ton	98	156	82
Precipitation	---------- in/month- ----------		
June	1.53	2.01	6.32
July	2.62	3.78	1.57
August	2.91	4.34	5.36

Another study examined the interaction of K fertility and corn yield on a Kewaunee silty clay loam soil near Oshkosh. The results of this study are shown in Table 3. The two compaction treatments included one where traffic was confined to inter-row areas with small equipment and another where the entire plot area was compacted with a 19 ton combine. Soil test K had been adjusted to either the optimum or high category and row K fertilizer was applied to half of the plots. Compaction significantly reduced yield. Some of the yield loss was recovered by K fertilization, but the best yields were found when the soil was not compacted and the crop was fertilized adequately.

A similar study was conducted at the Arlington Agricultural Research Station on a Plano silt loam soil that examined the effect of compaction prior to the direct seeding of alfalfa and K fertilization. Compaction in forage production can be significant, especially where manure is applied prior to direct seeding. Table 4 shows the yield reduction associated with compaction over the life of the alfalfa stand (seeding year plus three hay years). Most of the yield loss occurred in the seeding and first hay year. As with corn, a response to K fertility was found. It is believed that the reduction in porosity caused by compaction reduces oxygen availability to roots, limiting root respiration, and thereby limiting K uptake. Potassium fertilization maintains a higher level of K at the root/soil interface and apparently promotes K uptake under restricted conditions.

Table 3. Effect of soil compaction and K fertilization on the yield of corn at Oshkosh, WI (2-year avg.)

Compaction	Soil Test K	Row K	Yield (bu/a)
< 5 ton	Optimum	No	151
	Optimum	Yes	168
	High	No	168
	High	Yes	168
19 ton	Optimum	No	129
	Optimum	Yes	164
	High	No	148
	High	Yes	151

< 5 ton was not compacted, 19 ton 100% of area was compacted Row K = 45 lbs. K_2O/a

Table 4. Compaction and K fertility effect on alfalfa yield at Arlington, WI (4-year total)

Compaction	Soil Test K	Yield (ton DM/a)
< 5 ton	Optimum	11.1
	High	10.8
	Very High	11.4
< 14 ton	Optimum	9.1
	High	9.8
	Very High	10.2

Alleviating Compaction

Whenever possible soil compaction should be avoided. Practices such as limiting operations on wet soils, reducing load weight when possible, and controlling traffic will go a long way toward limiting compaction and maintaining soil productivity. Adding extra tires (duals) will spread the vehicle weight over a greater area, but will likely not reduce compaction. In fact, duals may encourage operations on wetter soils and compact a greater soil volume. Control traffic by limiting practices, such as "chasing the combine" with grain carts or driving grain trucks or nurse trucks for manure or fertilizer applications in fields.

Often deep tillage or subsoiling is considered when compaction problems are severe. Some farmers routinely subsoil as a form of primary tillage. Subsoiling can be conducted with a variety of tillage tools that will have a variable effect depending on soil conditions, the depth of tillage, and the tool used. A four year on-farm research study conducted recently in Manitowoc County showed that subsoiling with a relatively narrow straight shank produced higher yields than an aggressive parabolic tool that shattered the entire soil volume. It is possible that the soil strength was minimized with the more aggressive tool and soil conditions were less favorable following tillage. Yield differences were significant in three of four years. This response was site-specific as similar studies conducted at other locations did not show a response to subsoiling.

Before deciding to subsoil it is important to diagnose the existence of compaction and to record the depth of the restrictive layer. If subsoiling is done it should be conducted 1-2 in. below the layer. Other subsoiling considerations include:

- Some subsoiling operations will bury too much crop residue and may affect conservation planning
- Subsoiling that inverts the soil may bring clay and less fertile soil to the surface
- More stones may have to be picked
- 40-50 hp per shank is needed to pull most subsoilers
- Always include untreated check strips to determine if subsoiling is beneficial

Summary

Soil compaction problems will continue to be an issue in modern agriculture. Use common sense to avoid the occurrence of compaction. Reduce loads, stay off wet soils, and control traffic. Maintain soil fertility, especially with respect to K. Use a complete starter fertilizer for corn and be sure to resupply crop K removal for alfalfa. Look for compaction symptoms and physically identify the existences of a restrictive layer before conducting subsoiling operations. Do not abuse the soil in the fall, expecting that over-winter condition will correct compaction.

University of Wisconsin-Extension

Frost Damage to Alfalfa

by **Dan Undersander**

The cold temperatures in early spring can cause some frost damage to alfalfa. Following are recommendations for evaluating damage and taking action.

New seedings: Damage to new seedings has been minimal due to their excellent frost tolerance. To determine if damage has occurred examine plants - they will first appear to wilt and then die over the next 3 to 5 days. If plants die back to the ground, the plant is dead. At least one set of leaves must have escaped damage for recovery to be expected. Determine the number of living plants per square foot. If more than 20 plants per square foot remain, stand will survive in good shape. As stands are thinner than 15 plants per square foot consider top seeding alfalfa.

Established stands: Evaluate the stands to determine 1) if less than 30 % stem tops are damaged, 2) if most or all stem tops are damaged, and 3) if the stems are frozen back to the ground. Damaged means wilting (usually visible in about 24 hours after frost) or yellow to brown discoloration (usually visible 3 to 5 days after the frost).

1) *If less than 30% of stem tops show wilting/browning from frost, do nothing*. Enough stems remain to provide good growth and yield of first cutting. Stand will have some yield reduction of first cutting but will recover completely on second cutting.
2) *If most or all stem tops are damaged and stand is less than 10 inches tall, do nothing*. The growing points have been killed but the alfalfa will form new buds at lower leaf junctures (axillary buds) and continue growing (first cutting might be delayed). Alfalfa may demonstrate some horizontal growth. Mowing existing top growth will not enhance recovery. If stand is over 12 inches tall, harvest and allow to regrow. None of the alfalfa that was frozen in the Midwest was over 12 inches when frosted to our knowledge. Note that frozen material may be high in nitrate.
3) *If all stems on a plant are frozen back to the ground, the plant in dead*. This extent of frost damage has not occurred in the Midwest to our knowledge. However, if observed and fewer than 5 plants per square foot remain, consider rotating to another crop and replanting alfalfa in another field to avoid autotoxicity.

Just the Facts Jack: Soybean Planting Date, Seeding Rate and Seed Treatment Recommendations

Shawn P. Conley
State Extension Soybean and Small Grain Specialist

When I am asked a direct question from a farmer or a crop consultant my response is always as follows… Do you want the short answer or the long answer as I can say the same thing in 5 minutes or 5 hours. Their response to me is almost always the same…"Just the Facts Jack." In this article I will attempt to answer three very agronomically important and challenging questions in a very succinct manner. However as we all know brevity can be a gift or a curse depending upon the context of the question. With that being said here we go!

Question #1. When should I start planting soybean? My general response is to start planting your soybean crop ~7 to 10 days before you start putting your corn in the ground with the caveat that the soil is fit and you are following your crop insurance replant dates (However…IMHO, Jim Specht acronym,: I do believe that RMA needs to revisit these dates for Northern soybean growers). We have measured soybean yield loss due to delayed planting date as early as ~April 25th however the rapid yield decline (up to 0.5+ bpa per day) occurs at ~May 10th. As you would expect the magnitude of this planting date yield response is soil and climate dependent and yield losses in some areas (TED's) where as high as 2.8 bpa per week for delayed planting.

Question #2. What is the optimal soybean seeding rate? The quest for the optimal agronomic soybean seeding rate for yield vs. the optimal economic seeding rate has been an ongoing debate. Fortunately a large group of academics and industry (thank you Corteva) were able to combine data sets and address this question. Our results suggest that for "on-time" soybean planting dates the optimal agronomic soybean seeding rate to achieve 99% yield potential ranged from 237,000 to 128,000 seeds per acre (assuming 90% germ) across environments; whereas the optimal economic soybean seeding rate ranged from 157,000 to 103,000 seeds per acre. Thankfully this roughly confirms my original recommendation that you buy a bag an acre (140K) and place ~20% more seed on the low yielding acres and ~20% less on the high yielding acres. If planting is delayed however we do recommend that you increase your seeding rate accordingly (Adjust Your Seeding Rate (Higher) But Not Your Maturity Group For Late May Planted Soybean).

Question #3. When do I use a soybean seed treatment? I purposely placed this questions last as I know it will draw significant ire; however the data are what they are. Soybean seed treatments should only be used in some early planted soybean situations and/or if you have a history of or have scouted for an insect (i.e. Bean leaf beetle) or a pathogen (i.e. SDS) that exceeds economic thresholds.

For more information, visit https://coolbean.info.

Dairy Situation and Outlook—April 21, 2021

By Bob Cropp, Professor Emeritus
University of Wisconsin Cooperative Extension, University of Wisconsin-Madison

Despite relatively strong milk production growth dairy product prices continued to show strength during April. While prices on the CME moved up and down during the month, the price of cheese, dry whey, butter and nonfat all strengthened. The 40-pound cheddar block price was as low as $1.74 per pound, strengthened to $1.80 and current is $1.7950. Cheddar barrels were as low as $1.5125 per pound but have strengthen currently to $1.8050. Barrels have been well below the block price but now have surpassed blocks. Dry whey ranged from $0.63 per pound to $0.7025 and currently is $0.6825. Butter ranged from $1.8150 per pound to $1.950 and currently is $1.7925. Nonfat dry milk ranged from $1.18 per pound to currently at $1.24. The result of these stronger dairy product prices the April Class III price will be near $17.70 compared to $16.15 for March and the April Class IV price near $15.50 compared to $14.18 for March.

These stronger prices are the result of several factors. Food service which normally accounts for about 50% of cheese and butter sales has improved as more restaurants have more fully opened and some schools have returned to partially or full in classroom instruction. Dairy products have been purchased under the Farms to Families Food Box Program which was to end on April 30th but has been extended to the end of May. And there have been dairy product purchases for the Supplemental Nutrition Assistance Program (SNAPP). Dairy exports continue to increase as dairy product prices are competitive on the world market. Adjusting for Leap Year last year, the volume of February exports on a milk solids equivalent basis were 17.2% higher than a year ago. Cheese exports were up 1.1%, whey product exports up 33.9% as exports to China was up 159%, butterfat exports up 120.4% and nonfat dry milk/skim milk powder exports were up 36.1%.

USDA estimates milk production for the month was 1.8% higher than a year ago. Milk cow numbers continue to increase with 8,000 more than February resulting in 77,000 more cows than a year ago for an increase of 0.8%. The increase in milk per cow slowed some with an increase of 1.0%. There were major milk cow expansions from a year ago in Texas with 27,000, South Dakota 18,000, Michigan 14,000, Minnesota 17,000, and Indiana 17,000. This resulted in increases in milk production from a year ago of 3.9% for Texas, 13.4% for South Dakota, 3.5% for Michigan, 7.6% for Minnesota, and 10.0% for Indiana. Wisconsin also added 7,000 cows and had an increase in milk production of 3.7%. California had 2,000 fewer cows but more milk per cow resulted in 1.5% more milk production. Milk production was up just 0.8% in Idaho and 0.5% in New York. For March Texas surpassed New York as the 4th leading milk production state. Milk production was considerably lower in Florida down 7.3% with fewer cows and lower milk per cow, Arizona down 3.1% also from fewer cows and lower milk per cow and New Mexico down 1.1% with lower milk per cow.

The level of milk production for the remainder of the year is very crucial to how milk prices will fair. USDA is forecasting a relatively strong increase in milk production for the year being up 2.3% higher than last year Leap Year adjusted. Milk cow numbers are forecasted to average 72,000 head higher or 0.8% and milk per cow 1.5% higher. This amount of milk will be difficult to move through the domestic market and exports and maintain relatively favorable milk prices. But milk production could well slow by the second half of the year as higher feed costs could encourage heavier culling of cows and ration adjustments that reduces the increase in milk per cow.

Continued improvement in the economy, further opening of restaurants, return of fans to sports events, return of conferences and in person classroom instruction all for the second half of the year would support milk prices. With some improvement in the world economy, modest increase in milk production around 1% for major dairy exporters like Western Europe, New Zealand and Australia, and U.S. dairy product prices competitive on the world market should all be favorable for dairy exports this year. But unless milk production ends up less than what USDA is currently forecasting there will a lot of pressure on milk prices.

Class III futures have been somewhat volatile during the month with Class III at times in the $17's and in the $19's. Class IV futures have shown continued strengthening. Currently Class III futures are rather optimistic being in the $19's May through September and the higher $18's October through December. If these prices are realized for Class III, the average for the year would be close to the $18.16 average last year. One needs to recognize how important dry whey prices are. Strong exports have strengthened dry whey prices from $0.39 per pound a year ago to currently $0.6825. This strength adds about $1.80 to the Class III price. Class IV futures are in the $16's May through July and the $17's August through December. USDA's latest forecast is not this optimistic. USDA forecasts Class III to average 17.10 for the year compared to $18.16 last year. The Class IV price to average $15.15 compared to $13.49 last year.

So, uncertainty as to where milk prices will end the year continues. Unless milk production ends up lower than what USDA is currently forecasting, in my opinion $19 Class III futures are too optimistic. I could see Class III in the $17's. I hope I am wrong, but time will tell. We will need to keep watching how things develop month to month.

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