SCNY Dairy & Field Crops Digest

Cornell University
Cooperative Extension
South Central New York Dairy & Field Crops Team

Cropping Notes -Janice Degni, Area Extension Field Crops Specialist

Harvest Is Upon Us!

The corn crop is quickly reaching maturity for harvest. Season long stresses and the dry August (approximately an inch of rain fell during the month around the region) has left the corn drier than we might have expected. Some will already be chopping when this newsletter arrives. It is time to prepare for harvest checking fields, cutting stalk samples, chopping them up and testing whole plant dry matter. We began checking fields for drymatter the first week of September. Using a chipper/shredder we chopped stalk samples collected from fields and used a koster tester for dry matters. For field moistures we add 2-3 pts of moisture to the koster result. Results were dryer than expected and dryer than what milk-line alone might indicate. [The current recommendation is to use milkline to start checking whole plant moistures.] A 103 day variety, planted in early May tested 31% DM. A field with severe northern corn leafblight tested 40% DM. Other healthy corn samples have tested in the mid 30's for DM, which is ideal for uprights but getting dryer for bunkers.

See page 4 for Corn Silage Harvest Guidelines.

Soybeans

Corn diseases have been spotty and are not as widespread as last year, generally. Some farms who have experienced bad pressure in past years have protected their crop with fungicide this year. The later diseases arrive the less yield harming damage they do. They may still make the crop look ugly though.

A dry August is far from ideal for soybean yield. Despite that pod sets look strong in many fields. If dry conditions persist we could end up with smaller beans. Aphids appeared late into the season well into pod development and were hit and miss; super heavy on some fields and absent on others. Most have flown the coop by now which you can see on the leaves as white specks which are the aphid's shed skins.

White mold has finally shown itself in fields the last week of August. The early signs are indicated by wilting plants here and there. If you follow the wilted stem you can usually find the cottony mold growth or the black sclerotia growing in or on the stems. The dry conditions help slow disease development. It's a wild guess to say how much yield will be lost by harvest time because the weather will encourage or inhibit the rate of spread.

Management Guidelines for full maturity beans:

"*Warm weather in August or early September does not hasten maturity much, unless it causes water deficit stress. Sometimes, temperature is blamed for stress because hot temperatures often accompany drought. A cool fall does not delay maturity much either, although yields may be reduced if the cool weather is accompanied by heavy rain, causing disease. Unlike the flowering response, maturity is more strongly influenced by photoperiod. The rapid shortening of days starting in mid-August drives the soybean to maturity; temperature has only a small influence at this point. Sub-optimum plant densities become readily apparent at harvest time. Above-optimum plant densities cause lodged plants that are difficult to harvest, thus lowering the harvested yield. Below-optimum plant densities cause branching and low pod set. Heavily podded branches may break off easily and fall to the ground. Also, pods produced very close to the ground are difficult or sometimes impossible to harvest mechanically.*

Harvest timeliness is crucial for soybean. Ideal bean moisture content at harvest and for storage is 13 percent. When harvest begins at higher moisture percentages, drying costs will be added for

(Continued on next page)

Inside this Issue	Pg.

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Building Strong and Vibrant New York Communities

"Diversity and Inclusion are a part of Cornell University's heritage.
We are a recognized employer and educator valuing AA/EEO, Protected Veterans, and Individuals with Disabilities."

(Continued from cover)

safe storage. In contrast, harvest delayed to less than 13 percent moisture causes increased pre-harvest shatter loss, sickle-bar shatter loss during harvest, increased number of split beans, and bean weight loss.

To reduce harvest losses, drive at the proper speed and check concave clearance, cylinder speed, sieves, and air velocity. Be sure the reel speed and ground travel are synchronized to minimize sickle-bar shatter loss. In addition, cut close to the ground, leaving short stubble. A 9 cm (3.5 inches) stubble contains 5 percent of the crop; a 16.5 cm (6.5 inches) stubble, 12 percent." (Soybean Growth and Development, Iowa State University)

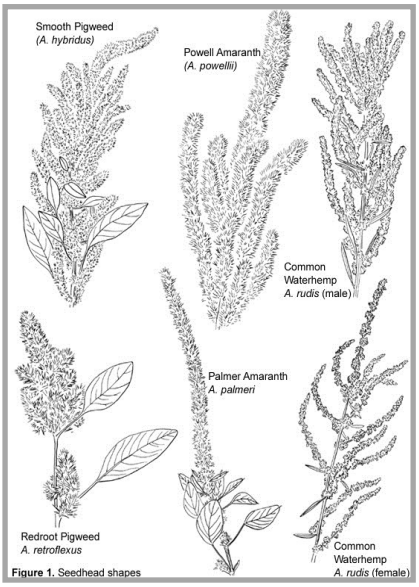


Figure 1. Seedhead shapes

Large Pigweeds

Palmer Amaranth and Waterhemp have become problem weeds in the Midwest. The popular press has referred to them as "Superweeds". They are large, aggressively growing weeds (6-8' tall) that set thousands of seeds/plant and can be glyphosate resistant. I was asked to identify such a mysterious weed this summer. It turned out to be Powell Amaranth, a close cousin and equally aggressive in growth and seed production. If you notice unusual weeds in your fields please call for identification.

Android App, High Moisture Shell Corn Price Calculator-Betsy Hicks, Area Dairy Specialist

To help farmers better evaluate their options, the University of Wisconsin-Extension released a Smartphone app to provide a simple way to help estimate the market value of HMSC based on three main variables – dry corn moisture, current corn moisture and price per bushel.

The HMSC$ app is free and available for Android smart phones and tablets on the Google Play store by searching for "HMSC".

Farmers can use this app to help determine an equivalent value for wet shell corn when compared with a dry shell corn price – a link to current local elevator dry corn bid prices is built into the app. The equivalent wet price is then calculated and displayed in both price per ton and price per bushel. Additional costs for drying and/or shelling can be evaluated under the expense tab. The app also features the ability to email the results directly to others.

"Although a desktop Excel spreadsheet for pricing HMSC is available on the Wisconsin Center for Dairy Profitability web site, it doesn't have the ability to bring up current market information or automatically share the results", said Greg Blonde, UW-Extension Waupaca County agriculture agent. "When you're out in the field or on the go, the HMSC$ app is a great resource tool to have on your Smartphone or tablet computer."

Blonde also noted the app may be useful to grain elevator managers, as well as Ag lenders and farm managers for valuing their grain or feed inventories.

If you are looking for a spreadsheet call Janice at 753-5215 or check our website.

Late Summer is a Good Time to Control "Deep Rooted" Perennial Broadleaf Weeds

Russell R. Hahn, Soil &Crop Sciences, Cornell University

All perennial weeds can be troublesome; however, "deeprooted," creeping perennial broadleaf weeds such as field bindweed, hemp dogbane, horsenettle, and common milkweed are among the most difficult to control. Like annual and biennial weeds, these perennials reproduce by forming seed. In addition, they spread by rhizomes (underground stems). Buds or growing points are found all along these underground stems. Effective control programs must control newly germinated seedlings and minimize the ability of these underground buds to produce new above ground shoots. Between-cropping applications of translocated herbicides during late summer or early fall have proven more effective than other programs for control or suppression of these perennial broadleaf weeds.

Rhizomes are Key to Survival

Rhizomes are the key to the survival of these perennial broadleaf weeds since they serve as a storehouse for food reserves (carbohydrates). It is these food reserves that allow these plants to survive winter. In the spring, these creeping perennials draw on these reserves to make new growth. During this period of vegetative growth, carbohydrate movement is mainly upward in the plants. The depletion of food reserves continues until the plants reach full leaf development and flower bud formation in mid- to late summer as shown in the accompanying figure. At this time, these plants have the maximum leaf area and the lowest level of carbohydrate reserves that they will have all season. After flowering, they start moving carbohydrates from the leaves into the rhizomes in preparation for winter. Effective chemical control of established patches of these perennial weeds takes advantage of this food storage period to move translocated herbicides down to the underground buds or growing points.

Translocated Herbicides

Translocated herbicides are the key to chemical control of "deep-rooted" perennial broadleaf weeds. Translocation refers to the movement of substances from one place to another, such as the movement of herbicides in plants. Herbicide movement in plants may follow the pathway of sugars formed during photosynthesis and/or the pathway of water that us absorbed by plant roots. Perennial weed control is most dependent on herbicide movement with the manufactured sugars. These sugars move out of the leaves to areas of rapid growth (growing points). Herbicide translocation to the growing points on the underground stems is most rapid and most effective when large amounts of sugars are being moved to the rhizomes. This usually occurs after full bloom in late summer and fall. Since 2,4-D, dicamba (Banvel, Clarity, etc.) and glyphosate (Roundup, etc.) are readily translocated from leaves into underground structures of perennial weeds, these herbicides can be effective in controlling or suppressing these weeds.

Between-Cropping Applications

Between-cropping herbicide applications are simply those that are made: 1) after harvesting one crop, 2) before killing frost, and 3) before planting the next crop. Situations that meet these requirements include fields where small grains (not seeded to legumes) or certain vegetable crops (peas, early sweet corn, etc.) have recently been harvested, and where the next crop won't be planted until fall (small grains) or until the next spring. These between cropping situations provide the opportunity to use non-selective herbicides such as glyphosate or to use high rates of 2,4-D or dicamba that cannot be used safely when crops are present. These herbicides should be applied when the weeds are actively growing. It may be necessary to allow the weeds to recover from damage done during crop harvest. Herbicide labels should be consulted to determine application rates for the targeted perennial broadleaf weeds. In all cases, tillage and other operations should be delayed for 7 or more days following application to allow time for herbicide translocation to the underground buds.

Rotational Crops

Glyphosate is inactivated upon contact with the soil so a variety of crops can be planted following the 7-day waiting period. Since dicamba, the active ingredient in Banvel, Clarity, and numerous other products, has residual soil activity, rotational guidelines must be followed to avoid injuring subsequent crops. Corn, soybeans, and all other crops grown in areas with 30 inches or more of annual rainfall may be planted 120 days after application of up to 4 pints/acre of dicamba products like Banvel and Clarity. Small grains may be planted if the interval between dicamba application and planting is 20 to 30 days (depends on which product is applied) per 1 pint/acre east of the Mississippi River. These waiting periods should exclude days when the ground is frozen. The waiting period for planting winter wheat or barley following late summer dicamba applications can be shortened by applying reduced dicamba rates in tank mixes with glyphosate or 2,4-D. Between-cropping applications of translocated herbicides provide the best opportunity to suppress or control "deeprooted" perennial broadleaf weeds; however, growers must act now to take advantage of existing situations or to plan a rotation that will allow such applications next year. Unfortunately, the typical dairy rotation of corn and perennial forages doesn't provide good opportunities for these between-cropping herbicide applications. ✻

Tips on Corn Silage Harvest Management

Randy Shaver, Joe Lauer and Kevin Shinners, UW Madison

1.**Target harvest for the right stage of maturity** which translates to the recommended moisture for your storage system to support a good fermentation.

Storage Unit	Recommended Moisture (%)
Upright silos	63-68
Bunker silos	65-68
Oxygen-limiting silos	55-60%
Ag bags	63-68 %

Whole plant moisture content rather than kernel milkline positioning should be your trigger for when to harvest corn silage

The best lactation performance by dairy cows has been shown to occur at 65%-70% whole-plant moisture. This range in whole-plant moisture content works well for achieving good preservation in horizontal silos. Harvesting whole-plant corn with more than 70% moisture increases seepage losses, increases acidity which can lower dry matter intake, and reduces dry matter yield per acre.

Whole-plant corn harvested for storage in upright silos may need to be chopped a bit drier than 65% moisture to minimize seepage. But, research has consistently shown reduced fiber and starch digestion along with reduced lactation performance for corn silage harvested at 60% moisture or less. Corn silage harvested at 60% moisture or less will need to be either chopped fine or processed to minimize losses in starch digestion and lactation performance.

2.**Recommended Length of Cut**

Harvester	Setting for Theoretical Length of Cut (TLC)
Conventional harvester (no crop processor)	3/8" (silage may vary from ¼" to ½")
Harvester with kernel processor Corn at 60% whole plant moisture	¾" TLC ½" TLC
Corn at 60% whole plant moisture	

Harvesting at the right moisture and particle size is crucial to making high-quality corn silage that is well utilized by dairy cows.

The general recommendation for corn silage harvested with a conventional harvester (without a crop processor is 3/8" theoretical length of cut (TLC). This recommendation may vary between ¼"to ½" TLC depending upon whole-plant and kernel moisture content, hybrid, and forage harvester.

To get good breakage of cobs and kernels with a conventional harvester it is often necessary to chop finer than we would like from an effective fiber standpoint. Unbroken kernels tend to pass through the cow undigested and large pieces of cobs or whole cobs are prone to sorting in the feed bunk. This typically means that only 5-10% of the silage should be in the coarse particle fraction or retained on the top screen of the Penn State-Nasco shaker box.

Evaluate percent coarse particle and degree of kernel and cob processing to determine the proper TLC setting for your harvester. Corn silage that is harvested past ½ milkline stage of maturity or with less than 65% whole plant moisture may need to be chopped at ¼" TLC. It may be possible to chop corn silage that is harvested at an immature or wet stage and hybrids that exhibit soft kernel texture at ½" TLC. It appears that brown midrib (low lignin) corn silage should not be chopped at less than ½" TLC to maintain effective fiber.

Based on our research, the recommended chop length for corn silage harvested with a harvester fitted with a crop processor is ¾" TLC. This normally means that 20-30% of the processed silage will be in the coarse particle fraction or retained on the top screen of the Penn State-Nasco shaker box. Processed corn silage that is harvested at black-layer or with about 60% whole-plant moisture may need to be chopped at ½" TLC. We have no data with processed silage at lengths greater than ¾" TLC, but there have been field reports of excessive equipment wear at TLC of an inch or more.

3.**Processor Adjustments:** Based on our research the recommended roll clearance ranges from 1/16 to 1/8 inch (1-3 millimeters). Roll clearance is determined using feeler gauges. If you do not have feeler gauges, lay the blade of your pocketknife flat between the rolls and adjust the clearance until the rolls tighten against the blade.

Monitor particle size and kernel and cob breakage to ensure that the forage harvester-crop processor is doing the job.

Harvest some whole plants, shake out the chopped material, and visually inspect each screen for the degree of kernel and cob processing. We would like to see all of the kernels broken. Pieces of cob, if discernible, should be no larger than the end of your little finger. If kernel and cob breakage is not complete, then tighten the rolls until kernel damage is complete or consider reducing your TLC. This may be necessary for processed corn silage that is harvested at black-layer stage of maturity or with about 60% whole-plant moisture. With processed corn silage harvested at an immature or wet stage that tends to mush, you can set roll clearance to 1/8" (3 millimeters). Make sure that you follow all recommended safety practices whenever making any machine adjustments.

Remember to use additives properly, pack well and cover securely to minimize storage losses and protect your investment. ¶

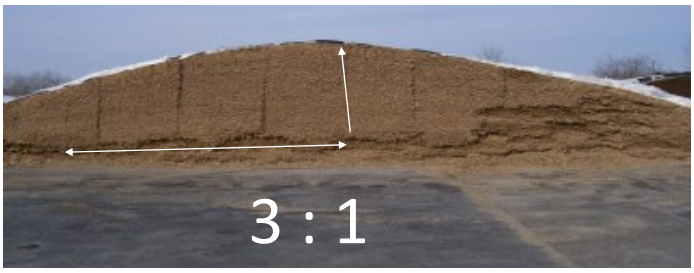
Building a Better Drive-Over Pile

By Ron Kuck, Cornell Cooperative Extension of Jefferson County

Drive-over piles and bunkers with walls are very popular storage options on many dairy farms. Sizing of bunks is very important to manage not only the packing and fermentation process, but feed out also. Let's look at building a drive-over pile without walls. These are becoming more popular and might cost less than storage with walls. They are also flexible for sizing providing you have the proper footprint. If built properly you can store and preserve a large amount of forage because of excellent packing and managing the feed out.

It has been estimated that 20 to 25 percent of corn silage stored in these drive-over piles never makes it to the cows because they are not sized and shaped correctly. A properly shaped pile should have the front, back, and sides at a minimum slope of 3:1. This means that for every 3 feet of width you should have no more than 1 foot of height.

Many folks disregard this and try to put too much forage in a small space and end up with a big pile of you know what (see picture at right). This is not only unsafe to put a tractor and operator on but you can not possibly pack the sides and back very well. This can result in more spoilage and shrink.



To size the pile correctly, you need to first determine feed out every day. Minimum is one foot from the face of the bunk. Recommendations are to have some carryover from year to year so bunk length should be approximately 400 feet (365 days plus at least 30 days). **There are some advantages to making more than pile but total length should equal at least 400 feet.**

An excellent spreadsheet for sizing your drive-over pile from the University of Wisconsin, Extension Forage Team, can be found at http://fyi.uwex.edu/forage/harvest/#sstorage. I can also forward it to you or give me a call and we can work it out with your forage team. And don't forget that CCE of Jefferson County can help your bunk crew build a better and tighter bunk. We have a developed a useful "real time" bunk density tool that can evaluate your packing density as you are filling your bunk or making your drive-over pile. We can demonstrate that the proper run to rise ratio can put and keep more forage in your bunk.

Sources: University of Wisconsin–Extension; Forage Management Associates; Keith Bolson, Ph.D; www.Extension.org.

In the case of chopping silage that has become drier than the optimal moisture according to your storage facility, there are some management recommendations that can aid in ensuring proper fermentation and quality of your forage.

- Decreasing length of cut and creating a finer particle helps to promote better packing, as well as increases the digestibility of the kernel. However, when the particle size is smaller as a result of the finer chop, rations should be modified to ensure adequate digestive fiber.
- Water can be uniformly added to dry silage to increase moisture content to aid in proper fermentation. When adding water to silage, the fill rate of most silos should be slowed as a result of slow water flow from most garden hoses and to ensure uniform water distribution.
- Liquid inoculant additives can be used to promote aerobic stability, such as propionic acid and *Lactobacillus buchneri*, and decrease mold growth. These inoculants should be added at concentrations based on the manufacturer's instructions.
- Kernel processing helps silage to pack more densely, which could lead to better stability of aerobic organisms, helping to aid in proper fermentation. This also boosts the forage quality by increasing starch digestibility of the kernel, which could be a problem in dry silage."

–Jessica Williamson, Penn State Extension

The Correct Tractor for Packing

Ron Kuck, CCE Jefferson

Many farms using bunk or drive-over silos for forage storage now are calculating the optimum tractor weight for packing to match the delivery rate of forage. Why? High forage density has low porosity (limits rate of oxygen transmission through silage) which limits spoilage or shrink. Packing is typically the weakest link in bunker silo management. When you see a bunker silo "settle," that is actually fermentation dry matter losses due in part to poor packing. Dense packing reduces dry matter losses, heating problems, and storage costs. The goal is to achieve more than 15 lbs. of dry matter per cubic foot for corn silage and haylage.

Select the correct tractor for packing.

The packing tractor should be as heavy as possible to achieve high forage density. Tractor weight can be augmented by adding weight to the tractor. This caged block not only added weight, but perhaps more importantly concentrated that weight over the axles to increase the downward pressure of the tires. As the harvest rate increases, the need for more than one pushing or packing tractor increases. Do not count the time spent pushing forage as packing weight or time! The packing pattern should allow the wheel patterns in the forage to overlap about half a tire to improve uniformity of packing. When dual wheels are used, try to have a wheel pack the forage left unpacked between the wheels of the previous pass.

Don't forget edges.

Watch near the walls where density has a habit of lightening up. Getting close to the walls is an issue because of fear of drivers getting too close to the wall and blades on packing tractors are wider than wheel base.

While dual wheels all around will improve traction and tractor maneuverability as well as being your heaviest tractors think about putting your heaviest single tire tractors to pack along the walls and edges.

Will it work?

Cornell Cooperative Extension was at a Sackets Harbor Dairy last fall evaluating packing density in three newly constructed bunk silos. We used our "real time" method of determining packing density to give immediate feedback to farm manager, packing crew, and nutritionist. We found that in the middle of the bunk, densities were satisfactory often exceeding the recommended 15# cu foot. Along the walls however densities had trouble reaching 13# cu ft. Suggestion was made to get heavy single tired (not duals) tractor onto bunk to pack the edges. The bunk crew, despite calculated evidence from our bunk density evaluation, still thought they were doing an acceptable job of packing. To humor the nutritionist, they brought the single tired tractor up on the bunk and drove along the edges. The wheels sunk into the pile and silage rose up to the rim of the tires visually indicating that bunk was NOT packed adequately. Consequently bunks 2 and 3 were packed with two dual tire tractors and a tractor with singles worked along the wall and edges. *(Continued on next page)*

Bunk densities revealed that the center of the bunk was now achieving 17# cu ft.

Bunk densities revealed that along the edges it was 15# cu ft.

Positive results

Note that the feed along the edge is similar to that in the middle. Compare to the poorly packed forage near the wall at the beginning of the article. The feed manager noted that silage went in at 31%DM and feed out six months later is still at 31% indicating very little shrink or loss. The farm manager noted to me that usually at this time of year (July) they start to limit corn silage in the ration to stretch the supply until the new crop is harvested. Not so this year. They will have plenty of corn silage to feed the expanding herd without planting, harvesting, or even purchasing more acreage for corn silage. Shrink that was once 23% is now approaching 10% after a few years of focused bunk packing and training of the bunk crew.

You can achieve this on your farm

Remember, Cornell Cooperative Extension of Jefferson County can help your bunk crew build a better and tighter bunk. We have developed a useful "real time" bunk density tool that can evaluate your packing density as you are filling your bunk.

And please, do not try to over-fill bunkers. Big rounded tops (looks like a loaf of bread) do not allow for adequate packing, and are a waste of time, fuel, and forage quality, not to mention this is also dangerous for the packer as well as potential avalanche at feed out.

Scenarios for Trying to Improve Silage Density When Forage Delivery Rate is Increased from 50 T AF to 100 T AF/hr. (Holmes and Muck (1999d)

Variables Changed from the Base Case	**Est. Dry Matter Density** (lbs. DM/ft^3)
No change in packing procedure	12.3
Add 20,000-lb tractor for 50% time	12.7
Add 20,000-lb tractor for 100% time	13.1
Add 5,000 lbs. weight to 30,000-lb tractor and do not use 20,000-lb tractor	13.0
Add 5,000 lbs. weight to both tractors and use both tractors 100% of time	14.1
Reduce layer thickness from 6 inches to 4 inches	14.5
Use both tractors 100% of time and reduce layer thickness to 4 inches.	15.6
Add 5,000 lbs. to 30,000-lb tractor and reduce layer thickness to 4 inches	15.5
Add 5,000 lbs. to both tractors, use each 100% of time, and reduce layer thickness to 4 inches	17.1

Pay Attention to Condition of Stored Corn

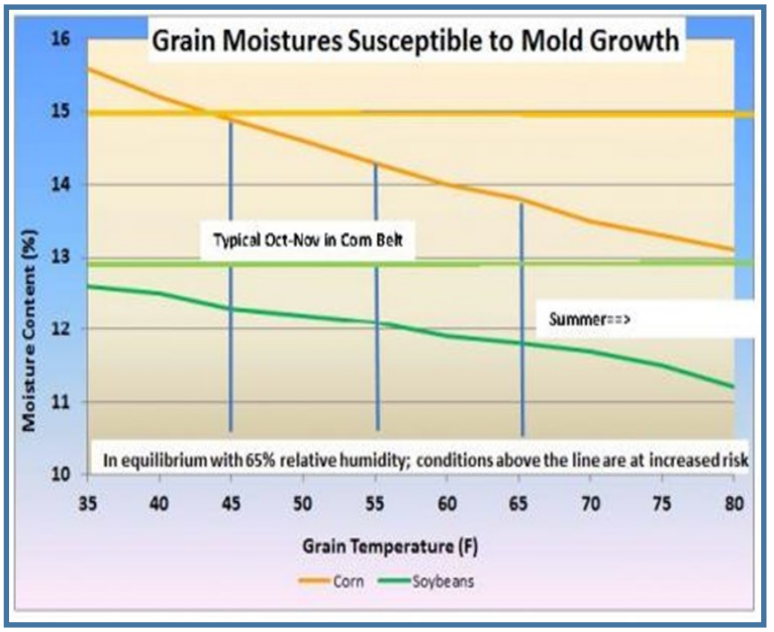
Charles Hurburgh, Professor, Ag and Biosystems Engineering, Iowa State University

Quality of stored grain must be maintained through the entire summer period, until stocks can be rotated in the fall. Summer storage is challenging because warm temperatures and high relative humidities put even dry grain at risk for mold and insect activity. Relative humidities in the last two weeks have been very high.

The chart explains why summer aeration can create either continued mold growth or excessive moisture shrink (below 14% moisture corn; 12% moisture soybeans). The horizontal lines are the market standard moistures for corn and soybeans (15% and 13% respectively).

Aeration in the fall is not likely to create overdry grain. Market moisture grain is not likely to spoil if steady fall conditions are maintained. However, in summer, even dry grain can spoil. Aeration in summer creates further drying and moisture shrink, and if the humidity is high, spoilage will continue.

Wet grain in storage now has probably used up its shelf life. It should be marketed quickly. Elevators and processors report that average condition of inbound corn is declining; there are still almost two warm weather months remaining to reach the 2015 crop.



Cost Cutting for 2016: Budgeting for $4 Corn and $9.25 Soybeans

Gary Schnitkey, Dept. of Agriculture & Consumer Economics, University of Illinois

Net incomes are projected to be very low for 2015 (*farmdoc daily* July 28, 2015). For low incomes to not repeat in 2016, commodity prices must increase or costs must decrease. At this point, counting on price increases seems imprudent. As a result, substantial cost cuts will need to occur to have positive incomes in 2016. In this article, cost decreases of $100 from costs contained in 2016 budgets are illustrated for cash rent farmland.

2016 Budgets and Projected Losses

The first two columns of Table 1 shows corn and soybean budgets for central Illinois farmland with lower productivity. Expected yields are 184 bushels per acre for corn and 53 bushels per acre for soybeans (see *2016 Illinois Budgets* for other yield levels).

Prices are $4.00 per bushel for corn and $9.25 per bushel for soybeans. These prices are relatively optimistic compared to 2016 fall delivery bids, which are near $3.70 per bushel for corn and $8.70 per bushel for soybeans. Note that very low prices are not needed to induce the need to cut costs. Moreover, current 2016 grain bids would result in substantial losses to grain farming.

Non-land costs are projected at $585 per acre for corn and $361 per acre for soybeans (see Table 1). Non-land costs are based on historically observed costs on grain farms enrolled in Illinois Farm Business Farm Management (FBFM), adjusted slightly downward due to changes in input prices (See *Revenue and Costs* publication for more detail). Cash rent is $236 per acre, near the average for this productivity of farmland.

Given these revenues and costs, net farmer income is -$66 per acre for corn and -$97 per acre for soybeans (see Table 1). For a 50% corn and 50% soybeans rotation, net farmer income is -$82 per acre.

Cost Cutting

Given revenues shown in these budgets, costs must be reduced to have positive returns. Cost cuts of $100 per acre will be used at the target. Cuts of $100 per acre would result in $19 per acre of net farmer income, levels that are relatively low and do not provide much margin. A $100 cost cut implies total cost reductions of 12% for corn and 17% for soybeans. These are very large cost reductions.

Cost cuts of $100 can be achieved in a variety of ways. Reductions in the second two columns include:

- Cash rent was reduced by $50 per acre from $236 per acre to $186 per acre (see Table 1). It was decided to split cost reductions between cash rent and non-land costs. Placing all cost cuts on non-land costs would result in a $136 per acre cash rent, roughly the same level as from 2004 through 2006.

- Misc expenses were reduced by $2 per acre from $8 per acre to $6 per acre, indicating a general emphasis on cost control.

- Machinery depreciation was reduced $20 per acre. For corn, this resulted in a reduction from $68 per acre down to $48 per acre. Reducing depreciation requires that capital purchases are very low. The $20 reduction assumes that capital expenditures are near $0 per acre. Even given a $0 target, it is not assured that machinery depreciation could be reduced by $20 per acre; however, near $0 in capital purchase would impact cash flows.

- Fertilizer costs were reduced by $10 per acre. For corn, this results in fertilizer costs from $138 per acre to $128 per acre. These costs are reduced either through lower rates. Hopefully, some price reductions in fertilizer costs may occur.

Seed costs were reduced by $18 per acre. For corn, this would reduce seed costs from $128 per acre to $110 per acre. How this cost reduction occurs is not exactly certain. Seeding rates may need to be lowered, and hybrids with lower technology may need to be purchased. Perhaps some price relief will exist for 2016 hybrids and varieties.

Focus of Cost Cuts

In the above example, the majority of non-land cost cuts were

(Cont. on next page)

Table 1. 2016 Budgets for Central Illinois Farmland with Lower Productivity

	2016 Budgets[1]		With $100 of Cuts[1]	
	Corn	Soybeans	Corn	Soybeans
Yield per acre	184	53	184	53
Price per bu	$4.00	$9.25	$4.00	$9.25
Crop revenue	$736	$490	$736	$490
ARC/PLC	20	10	20	10
Crop insurance proceeds	0	0	0	0
Gross revenue	**$756**	**$500**	**$756**	**$500**
Fertilizers	$138	$39	$128	$29
Pesticides	60	40	60	40
Seed	128	78	110	60
Drying	18	1	18	1
Storage	5	4	5	4
Crop insurance	26	18	26	18
Total direct costs	**$375**	**$180**	**$347**	**$152**
Machine hire/lease	$13	$9	$13	$9
Utilities	5	4	5	4
Machine repair	28	23	28	23
Fuel and oil	20	20	20	20
Light vehicle	2	1	2	1
Mach. depreciation	68	63	48	43
Total power costs	**$136**	**$120**	**$116**	**$100**
Hired labor	$18	$16	$18	$16
Building repair and rent	11	5	11	5
Building depreciation	13	11	13	11
Insurance	10	10	10	10
Misc	8	8	6	6
Interest (non-land)	15	11	15	11
Total overhead costs	**$75**	**$61**	**$73**	**$59**
Total non-land costs	**$586**	**$361**	**$536**	**$311**
Operator and land return	**$170**	**$139**	**$220**	**$189**
Cash rent	**$236**	**$236**	**$186**	**$186**
Net Farmer Income	**-$66**	**-$97**	**$34**	**$3**

[1] The first two columns are from the 2016 Crop Budgets. The final two columns include budgets with $100 per acre of cost cuts.

made to fertilizers, seed, and machinery depreciation. These three costs accounted for 71% of cost increases between 2006 through 2013 (see *farmdoc daily* September 16, 2014). These three costs plus pesticide costs account for 67% of non-land costs for corn and 61% for soybeans. Cost costs in these four areas must occur if sizable reductions in non-land costs are to occur.

Price Increases Achieving Same Result as $100 Per Acre Cost Decrease

Higher commodity prices could have the same impact on net farm income as cost reductions. A corn price of $4.65 for corn and $10.75 for soybeans results in the same income as $100 in cuts. The $4.65 corn price and $10.75 soybean price are close to projections of the long-run averages (*farmdoc daily* February 27, 2013). At these prices, income would be $19 per acre, a relatively low level, suggesting that costs need to be reduced even if prices approach projected long-run averages.

What Would Net Income be at Current 2016 Fall Grain Bids?

Current cash bids for 2016 delivery are $3.70 for corn and $8.70 for soybeans. At those current bids, net farmer income would be -$124 per acre without the $100 of cost cuts, given a split of 50% corn and 50% soybeans. With the $100 of cost cuts, net incomes would be -$24 per acre. Even after $100 of cost cuts, incomes would be negative given fall delivery bids, pointing to the risks that exist if costs are not cut.

Summary

At this point, relatively large cost cuts need to occur before positive incomes in 2016 budgets. Even with $100 per acre of cost reductions, incomes would be negative at current 2016 fall delivery prices. Even likely long-run averages prices result in low incomes without substantial cuts in costs.

Where cost cuts occur are an open question. In this article, one division of cost reductions are presented. If non-land costs are to decrease by a significant amount, cost reductions must occur from fertilizer, seed, pesticides, and machinery depreciation.

Obviously, large cuts in costs will be difficult. However, profitability in 2016 likely depends on making these cost cuts. ✪

Marketing-John Berry, Ag Marketing Educator, Penn State Extension

With expectations the final 2015 U.S. corn and soybean harvest will be at least slightly less than currently projected by USDA.

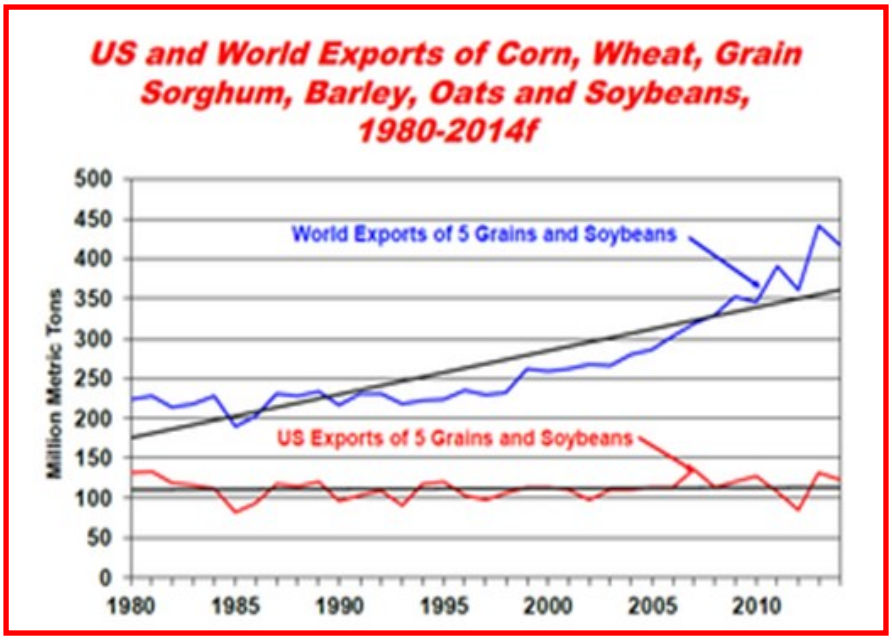
I also expect prices being offered would be more aggressive. What's up? Remembering that price is a function of the supply / demand balance let's look around us. Have you noticed what the largest global importer of commodities is experiencing? Additionally, our currency is relatively strong, ethanol production has plateaued, the 2014 harvest is not completely off the farm, and as the below chart shows; the U.S. is not as large a part of the global ag commodity market as it was in the past.

In 1980 the U.S. had roughly ½ of the global export market for our primary grains. Today we have between 1/3 and ¼ of this growing market. Although our crops remain a significant part of the global food supply other countries are playing a bigger and bigger role in feeding us all. The U.S. harvest does not dominate as it once did.

Given all the above I ask you to recall one of my main tenants of grain marketing – although it certainly is interesting to talk about, it really doesn't matter how we got here. The question is "what are we going to do?"

Harvest approaches and with what looks to be a respectable number of bushels in the field suggesting short term buyer needs can be met – "do we have access to adequate storage?" and, "should we store after harvest?"

Farmers are telling me current prices are not very exciting and they will not be delivering any more un-priced grain at harvest than necessary. I do see the reasoning behind part of this decision. Current cash basis and carry in the futures give an early indication for a return to storing corn. Soybeans are a different story with little indication there is going to be carry and so limited opportunities to lock in a return to storage. ✪



Daryll Ray, Harwood Schaffer, University of Tennessee

Tips and Considerations for Getting Started with Cover Crops

Mark Licht, Dept. of Agronomy &Tom Kaspar, USDA National Laboratory for Ag. and the Environment

Cover crops have been all the rage these past couple years because they are one of the practices that farmers can use to reduce losses of nitrogen and phosphorus from farm fields. Additionally, there are countless research trials that have documented the ability of cover crops to reduce erosion, build up or recycle nutrients, enhance soil health, assist with weed control, and/or provide forage or grazing. Cover crops, however, are not an "add on". Using cover crops requires a complete rethinking of your cropping system practices. Changes in priorities, timing, logistics, and operations are required to allow for successful implementation of cover crops into your cropping system. Adjustments may need to be made in the timing of nutrient application, timing or type of tillage practices used, timing of weed control and herbicides use, and timing of planting and harvest of main crops. For farmers and agronomists new to cover crops there are several tips and considerations that can ease the transition. Here are some suggestions to get you off to a successful start.

Start small: increase scale as your comfort level increases. This reduces the risk and lessens the additional time required for cover crop implementation. Like any new equipment or management practice, there is a learning curve. Smaller fields, irregular fields, or portions of fields prone to erosion and nitrogen leaching are good candidates to start with. Pick a field that is easy to see and monitor throughout the fall, winter, and spring.

Look for "easy" entry points in your farming system. In the first years of using cover crops identify situations, rotations, fields, or programs that make them easier to use by giving you extra time to manage and scout them, providing obvious benefits, or reducing risks and costs. Planting cover crops after corn silage, early maturing soybean, seed corn, small grains and on prevented planting acres or in drowned out areas of fields allow more time for planting and plant growth. Other easy entry points might be fields near livestock operations that are conducive for grazing or forage harvest; watershed programs that offer cost-share for cover crop seeding or implementation; or problem areas in fields that frequently have rill erosion or ponding. These entry points in farming systems allow more flexibility to learn what aspects of the cropping system need to be tweaked with the addition of cover crops.

Species selection and seed sources need to be determined early. Early determination of which cover crop species will be used will ensure seed availability or at least allow time to find alternatives. Beginners should keep seed selection simple and inexpensive by using oats or spring small grains before corn and winter small grains before soybean. Once you are comfortable using cover crops, then consider using other species or mixtures. Species selection requires answers to questions like: 1) what's the goal of using the cover crop, 2) will the cover crop grow and overwinter, 3) how will it be planted and terminated, and 4) what is the current and subsequent crop? These answers will guide you to winter cereal grains, spring cereal grains, legumes, brassicas, or perennial grasses and legumes that are commonly used as cover crops. Winter cereal crops typically have good fall and spring biomass growth and overwinter. Spring cereal grains grow well in the fall but will winter kill. Legumes are more expensive and grow slowly but have the potential to fix nitrogen and overwinter. Brassicas provide options to alleviate surface compaction or provide forage quality, but most don't overwinter.

Seeding rates need to be adjusted not only for the species selected but also based on how the cover crops will be planted and when they will be planted. Generally, seeding rates are based on how many seeds are needed to establish good cover when being planted with a grain drill. Aerial and surface broadcast planting necessitates slightly higher seeding rate due to less- than-ideal spread patterns, unpredictable seed-to-soil contact, and the possibility of dry conditions delaying or reducing germination. However, aerial and broadcast seeding does allow for timelier planting into standing corn and soybean crops before harvest.

Timing of seeding will vary depending on the cover crop species, type of planting method, and fall frost dates, among other factors. Consider your typical dates of the first hard freeze. In general, cover crops that don't overwinter need to be planted early enough to allow time for adequate fall growth. Cover crops that overwinter can be planted later because they will resume growth in the spring. Planting, drilling, or shallow incorporation of cover crop seed after harvest should ideally be completed by October 15 and no later than November 1 in central Iowa.

Spring termination of winter-hardy cover crops can be tricky but the benefits of spring growth are worth the effort. Termination of grass cover crops is recommended 14 days prior to corn planting and up to 2 days prior to soybean planting. For beginning cover crop users, grass cover crops should be terminated at less than 10 to 12 inches tall before corn planting. Glyphosate-based herbicides tend to be the most effective for spring termination. Note that glyphosate performance will be

(Continued on next page)

enhanced with the addition of ammonium sulfate and nonionic surfactants and applications on warm (60^0 or higher), dry spring afternoons.

Corn and soybean management following cover crops also requires change. Tillage becomes less desirable unless strip tillage is being used. Nutrient applications would best be moved to spring pre-plant or split applications. Adjustments or modifications may be needed to ensure planter units don't cause sidewall compaction or leave the furrow open. Pay special attention to planting depth, planter row unit down pressure, and closing wheel force and effectiveness. There is some evidence that starter fertilizer, increasing corn seeding rates by 10%, and leaving a cover crop-free strip where next year's corn row will be planted can reduce problems for the corn crop. Consider how soil residual herbicides you use in the spring and summer may affect cover crop germination, emergence, and growth in the fall. Pay attention to insects that may benefit from spring 'green' growth such as black cutworms and armyworms. Watch for seedling root diseases and use fungicide seed treatments especially when cover crops and cash crops that follow come from the same plant families.

crops. Go to field days. Talk to other farmers using cover crops. Read resources about cover crops keeping in mind the location and cropping system from which the information is coming. Not all cover crop information will be pertinent to your farm and your cropping system. Cover crops that grow well in lower latitudes probably won't grow the same way in northern latitudes. Cover crops planted after wheat harvest in late July or early August won't grow the same way planted after soybean harvest in early October.

In summary, to ensure success with cover crops start small, start simple, pay attention to detail, be timely, make planter adjustments, scout early and often, and think about the cropping system - not just the crop. Use the following resources to lessen your learning curve. ✱

Pricing Standing Corn with Penn State Spreadsheet: Here's A Tool For Running Your Own Numbers For Negotiating A Fair Price-Greg Roth, Professor of Agronomy, Penn State

With our crop situation this year there could be some farms with great yielding fields with a potentially low grain price and some other livestock or dairy operations that might be coming up short in silage production due to wet spots and damaged crops. So there will likely be some opportunities to buy or sell standing corn silage fields for feed.

To do this we first need a yield estimate. Yields can be estimated in a variety of ways. One is to weigh the silage or count the loads of silage that are exchanged. Another is through a kernel count method to estimate the potential grain yield and then converting to tons per acre using a grain equivalent of about 7.5 bu/ton. This number can vary depending on how well eared the crop is and other factor. This factsheet_ at http://corn.agronomy.wisc.edu/AA/pdfs/A045.pdf provides some review on this from Wisconsin.

Potential Grain Yield (bu/acre)	150	bu/A
Dry Matter of Harvested Silage	35.00	%
Market price for corn silage from silo	$ 55.00	$/ton
Cost of P2O5	$ 0.49	$/lb
Cost of K2O	$ 0.43	$/lb
Corn Silage Quality - % of Normal	100	%
Corn Grain Discount ($ per bushel)	$ -	$/bu

Grain Grower's Perspective (to Net the same amount from selling Standing Corn as if harvesting Shelled Corn)		Per Acre	Per Bushel
Grower's Gross Income(bu x price)		$ 600.00	$ 4.00
Harvest cost per acre	-	$ 40.00	$ 0.27
Grain Hauling (field to mill)	-	$ 37.50	$ 0.25
Drying Charge	-	$ 90.00	$ 0.60
Cost of additional P & K removal w/ silage harvest	+	$ 54.35	$ 0.36
Corn Grain Discount ($/bushel)	-	$ -	$ -
Chopped corn price, breakeven with shelled corn net	=	$ 486.85	$ 3.25
Potential chopped corn yield (Tons/acre)[1]		20.0	
Price per Ton of Unfermented Chopped Corn needed to Equal Shelled Corn Net	=	$ 24.34	

Buyer's Perspective (to Pay the same as buying corn silage from a silo)		Buy Standing Corn Per Ton
Price of corn silage from silo*		$ 55.00 *includes delivery charge
Harvest cost	-	$ 10.00
Storage Cost	-	$ 2.00
Dry Matter Loss	-	$ 7.15
Subtotal	=	$ 35.85
Corn Silage Quality Discount	-	$ -
Price per Ton of Unfermented Chopped Corn needed to equal Corn silage price delivered from silo	=	$ 35.85

http://www.nass.usda.gov/Statistics_by_State/Pennsylvania/Publications/Machinery_Custom_Rates/CustomRates%202012.pdf

	Your Farm:		2012 Machinery Custom Rates:	
Grain Hauling	$ 0.25	$/bushel	$0.20	$/bushel (Local)
Drying Charge	$ 0.60	$/bushel	$0.46	$/bushel
Corn Combining	$ 40.00	$/acre	$30.90	$/acre
Chop/Haul/Fill	$ 10.00	$/Ton	$9.60	$/Ton
Silage Delivery Charge	$ 5.00	$/Ton		$/Ton
Dry Matter Loss[2]	13	%		%
Storage Cost Silage	$ 2.00	$/Ton		$/Ton

Grain Grower's Perspective: Corn Price $/bushel	Chopped Corn $/Ton
$4.50	$28.09
$4.75	$29.97
$5.00	$31.84
$5.25	$33.72
$5.50	$35.59
$5.75	$37.47
$6.00	$39.34
$6.25	$41.22
$6.50	$43.09
$6.75	$44.97
$7.00	$46.84
$7.25	$48.72
$7.50	$50.59
$7.75	$52.47
$8.00	$54.34
$8.25	$56.22
$8.50	$58.09
$8.75	$59.97
$9.00	$61.84

Then we have to look at the issue from two perspectives. From the dairy producer's perspective, the crop should be worth something similar to what the corn grower would get from shelling, drying and hauling the grain to market, plus some compensation for the P and K removed in the silage harvest. Current prices for P_2O_5 and K_2O are about 0.49 and 0.43 dollars per pound.

From the corn growers perspective, the crop should be worth what an equivalent feed price would be worth, adjusted for the harvest and storage costs associated with getting it to that condition. This could be arrived at by finding out what cured silage could be delivered for or what the value of the corn silage is based on other feeds. I have seen estimates of 45 to $55/ton for the cured feed value. The final price should then be negotiated between dairy producer and corn grower estimates

We put together a spreadsheet at http://extension.psu.edu/business/farm/management/financial-management/calculators/corn-silage/CornSilage.xls/view to enable you to do some of your own estimates. This includes some of the factors above, plus current corn prices, and potential discount for grain or silage quality if either would be impaired. We also use a feed value as the market price of corn silage delivered from a silo. We will be updating with some current prices this week, but you can use some of your own numbers to get an idea of what might be appropriate. Based on few scenarios we have run we are looking at value between $24 and $35/ton for the standing crop in the field. ☪

Cornell University
Cooperative Extension
South Central New York Dairy & Field Crops Team

South Central New York Area Dairy & Field Crops Team

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CALENDAR OF EVENTS

Oct 1&2	**15th Annual NODPA Field Days,** B&W Banquet Facility, Pavillion, NY For more information visit http://www.nodpa.com/brochure_15thannual_final-lowres.pdf or contact Fay Benson at 607.753.5078 or email afb3@cornell.edu
Oct 9	**Taste of Tioga,** Tioga Downs, 2384 West River Road, Nichols, NY 6:00 PM-8:00 PM Culinary event to promote buying and eating locally in our community. The cost is $35.00. For more information visit: http://tioga.cce.cornell.edu/events/2015/10/09/taste-of-tioga
Oct 16	Natural Resources Conservation Service (NRCS) application cutoff date for the Environmental Quality Incentives Program (EQIP) for Fiscal Year (FY) 2016. **If you are interested in applying for an NRCS conservation program please visit:** http://www.nrcs.usda.gov/wps/portal/nrcs/detail/ny/programs/financial/eqip/?cid=nrcs144p2_027058
Oct 24	**Cortland County Farm Trail** This year the Farm Trail will feature 3 dairies and a Farm Market along a 15 mi stretch of Route 13 north from Cortland through Truxton. You can experience first-hand a diversity of size, cow breeds, technology and on-farm processing. You will be able to find the perfect pumpkin for jack-o-lanterns and fresh farm-to-table produce at Reakes Farm Market.

To-Do List: Corn Silage Harvest — Jim Conroe, Dairy Specialist, Prince AgriProducts

- Check whole plant moisture in all fields (BMR may fool you to look at)
- Set chopper to desired length of cut-1/2 to ¾ inch
- Longer if shredlage
- Set KP to proper setting based on moisture
- Keep an eye on kernels and make sure they are completely broken up *(Important and overlooked too often)*
- Inoculants added to insure proper fermentation and quality of forage at feed out
- Pack bunk with sufficient tractors and weight based on incoming rate of chopped corn *(difference between good fermented corn silage and compost is oxygen)*
- Cover bunk if/when it rains for a day or 2
- Wrap side walls of bunk if possible
- Proper tires, bags to keep plastic in place and air out (tires butt up against each other)

REMEMBER:

- ◊ Rumen is designed for fiber fermentation
- ◊ High quality forage **DOES NOT ASSURE** high milk production
- ◊ But low quality forage **GUARANTEES** low milk production
- ◊ Consider overall costs and milk income of your diet when deciding on varieties
- ◊ DMI trumps all (if a cow cannot eat enough you are limiting her ability for a profitable lactation). Nothing else really matters at that point
- ◊ Adjust diet to accommodate levels of lignin, NDF, effective NDF, starch and overall digestibility or UN-digestibility!