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Agronomy Advice

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Yield and Quality of July Planted Corn

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The Kernels

- Corn has two peaks in forage quality: one at pollination and one at 50% kernel milkline.
- Bareness generally reduces yield and grain content resulting in increased fiber content, but this is often accompanied by lower lignin production that increases fiber digestibility. Also, the forage has higher sugar content, and higher crude protein than normal corn silage.
- Relatively small changes (5 to 8% decrease) in forage quality (Milk per ton) occurs with July planting dates compared to corn planted April 28 to June 1.
- Milk per acre of July planting dates decreased 17 to 92% to levels ranging from 2,300 to 24,000 lbs milk/ A.

Record high prevent plant acreage occurred in 2019. In July, many acres were planted to cover crops, including corn (Figure 1). Due to low forage inventories, USDA-RMA allowed cover crop acres to be harvested for silage.

Corn has two peaks in forage quality: one at pollination and one at 50% kernel milkline. Forage quality as measured by Milk per Ton is high during vegetative phases prior to flowering. Like all forages, quality decreases after flowering. Unlike other forages, quality improves beginning around R3. The early peak in forage quality at pollination is high in quality but too wet for ensiling. The later peak is more familiar and is the one we typically manage for when producing corn silage because it maximizes both biomass yield and quality.

If pollination is unsuccessful, the forage quality following the first peak does not change and will continue to remain high due to higher sugar content (water soluble carbohydrates), higher crude protein, higher crude fiber and more digestible fiber than normal corn silage. Unsuccessful pollination (bareness) generally reduces yield and grain content resulting in increased fiber content, but this is often accompanied by lower lignin production that increases fiber digestibility.

If pollination is poor yet some kernels are developing, the plant can gain dry matter and farmers should wait with harvest.

Harvesting and Handling Barren Corn

The harvesting challenge is that green, barren stalks will contain 75-90% water. Barren corn is difficult to harvest because it is rank and too wet for silage storage structures. Arlington UW-ARS staff have had some success using a discbine to cut barren corn into a windrow. The windrow would need to dry to desiccate the forage. A forage chopper with a hay pickup attachment is then used to gather and chop the windrow into a wagon for transport to a storage structure for ensiling.

Grazing is an option but be careful about nitrate toxicity problems. If grazing, consider potential for nitrate toxicity. This is especially likely to be a problem if growth was reduced to less than 50% of

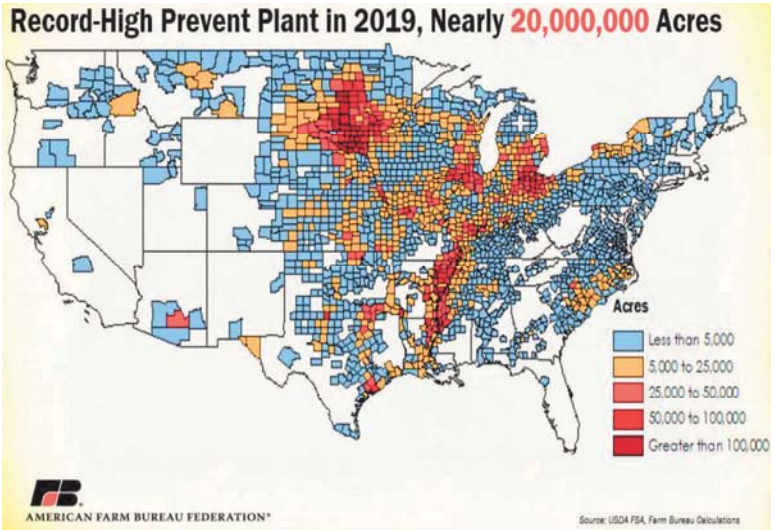

Figure 1. Prevent plant acreage in 2019. Data source: Farm Bureau and USDA-FSA.

Table 1. Forage yield and quality of corn with differing amounts of pollination (n= 24; 1992 and 1993).

Ear fill	Forage yield	Crude protein	NDF	ADF	IVTD	NDFD
%	%	%	%	%	%	%
0	81	8.5	57	30	74	52
54	93	8.0	54	28	76	52
100 (control)	100	7.5	49	26	77	54
LSD (0.05)	6	0.3	1	1	1	1

normal and/or high levels of nitrogen were applied.

If the decision is made to harvest the crop for ensiling, the main consideration will be proper moisture for storage and fermentation. The crop will look drier than it really is, so moisture testing will be critical. Be sure to test whole-plant moisture of chopped corn to assure yourself that acceptable fermentation will occur.

Forage quality of barren and poorly pollinated corn

Coors et al. (1997) evaluated the forage quality of corn with 0, 50 and 100% pollination of the kernels on an ear during 1992 and 1993. These plots were harvested in September.

A typical response of corn to stress is to reduce grain yield. Bareness reduced whole-plant yield by 19% (Table 1). Kernels on ears of 50% ear fill treatments were larger and tended to more than make up for reduced numbers (Albrecht, personal communication). With the exception of protein, as ear fill increased, whole-plant forage quality increased.

Yield and Quality of July Planted Corn

We conducted experiments during 2005 and 2006 to determine what could be expected by planting corn in July. Three corn hybrids (brown midrib, full-, and shorter-season) were planted on five different dates from April 28 to August 1 at Arlington, WI. The 2005 growing season had a killing frost on October 26, which was three weeks later than normal.

Seasonal dry matter production after planting during July ranged from 0.7 to 7.5 Tons DM/A while the same hybrids planted April 28 to June 1 produced 8.7 to 10.0T DM/A (Table 2). Milk per acre is significantly lowered 92 to 17% to levels ranging from 2,300 to 24,000 lbs milk/ A for planting dates in July. Crude protein, NDF and NDFD increased with later planting dates. Although, little starch content was measured in later planting dates, overall milk per Ton tended to decrease slightly. Thus, relatively small changes in Milk per ton occurred during planting dates in July with levels ranging from 2800 to 3200 lbs milk/T, which was a 5 to 8% decrease from corn planted April 28 to June 1.

Corn can produce significant dry matter yield when planted during July, but the amount produced depends upon when a killing frost occurs. Growers need to check on options available from their insurance companies before taking action and planting corn in late June and July for emergency forage. Herbicide labels must be adhered to before switching to other crops.

Table 2. Corn forage yield and quality response to July planting dates.

Planting date	Forage yield	Forage moisture	NDF	NDFD	Starch	Milk per Ton	Milk per Acre
	T DM/A	%	%	%	%	Lbs/T	Lbs/A
2005 - Killing frost on Oct. 26							
April 29	9.5	57	43	60	34	3420	32400
June 1	10.0	52	46	59	32	3280	32800
June 30	7.7	58	51	62	20	3240	24800
July 15	5.6	69	54	66	12	3210	18100
August 1	2.8	77	59	73	1	3110	8700
LSD (0.10)	2.4	4	3	2	3	160	2800
2006 - Killing frost on Oct. 12							
April 28	9.1	64	45	57	33	3270	29600
June 1	8.7	49	42	56	35	3330	28900
June 30	5.9	68	55	63	18	3120	18500
July 14	3.5	77	68	78	0	2820	10000
July 31	0.7	76	68	83	0	3170	2300
LSD (0.10)	0.8	2	3	2	2	110	2900