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Agronomy Advice

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Changing Corn Production Practices When Energy Costs Increase

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Guidelines

- Management decisions that can dramatically affect energy costs in corn production include: hybrid maturity, planting date, fertilizer rate, tillage (or number of field operations), irrigation, and transgenic technologies (pest control).
- When selecting hybrids using performance data, consider yield and moisture rather than yield alone. Use anticipated grain prices and drying costs to figure profit potential for different hybrids.
- Hybrid maturity directly affects profit and energy conservation. To reduce drying costs, farmers should choose high-yielding hybrids which are as dry as practical at harvest.
- Understanding your farm growing season (first and last frost dates, GDU accumulation, planting date, etc.) and field characteristics (slope, aspect, soil texture, surface residue, etc.) will help in selecting adapted hybrids.
- Plant full-season hybrids first followed by shorter-season hybrids on dates that ensure maturity before fall frost. If planting is delayed, switch to shorter-season hybrids.
- Reduce the number of trips across the field by moving to reduced- or no-till planting systems. Also, consider using transgenic crops to reduce the number of trips and chemical costs for control of pests.
- Harvesting at 20 to 25% grain moisture is a reasonable compromise between drying cost and harvest loss.

Energy prices have risen dramatically. Since corn is an energy intensive crop, efficient energy management is a major factor in maintaining a profitable production program. Management decisions that can dramatically affect energy costs in corn production include: hybrid maturity, fertilizer rate, planting date, tillage (or number of field operations), and transgenic technologies (pest control). Nitrogen fertilizer and artificial drying are the major energy factors in corn production.

Hybrid maturity

Relative maturity (RM) is determined by comparing grain moisture of hybrids at harvest. Corn is mature when kernels reach maximum dry weight. Optimum RM depends upon the harvest, use and storage methods on each farm. Corn for silage is ready as early as 10 days prior to maximum kernel dry weight, while corn picked for grain is not ready until grain moisture content reaches 23 to 28%.

Longer-season hybrids have greater potential for higher yields at most locations. In southern WI, as RM increases, grain yield increases 2.2 bu/A. At a corn price of $2.50 and drying cost of $0.02 per point moisture bushel, grower return increases $4.00 /A for each RM unit.

For example, at Arlington grain yield increases to a maximum at 106-days RM (Figure 1a). At most locations, a significant relationship exists between grain yield and RM. However, at Marshfield and Valders, no relationship between grain yield and RM exists over multiple years of testing (Table 1).

The optimum relative maturity for grower return depends upon the corn drying method (Table 2). The RM that optimizes grower return is different from the RM that optimizes grain yield when drying costs are involved. For example, at Arlington using an on-farm drying method, grower return is greatest with a corn hybrid RM of 101-days RM (Figure 1b and Table 2). At Marshfield, a 93-day hybrid optimizes grower return.

Although farmers generally get greatest yields by planting full-season hybrids early, many short-season hybrids produce yields competitive with the best full-season hybrids and are drier at harvest (Figures 1a and 1b).

Traditionally, the mix of hybrid maturities grown on a farm vary according to the risk one is willing to assume (i.e. 25% of acres grown to full-season, 50% to mid-season, and 25% to short-season maturities). Others recommend mixing hybrid maturities according to the type of environment predicted. The best approach may be to select hybrid maturities based solely on the intended use and drying method in the production system.

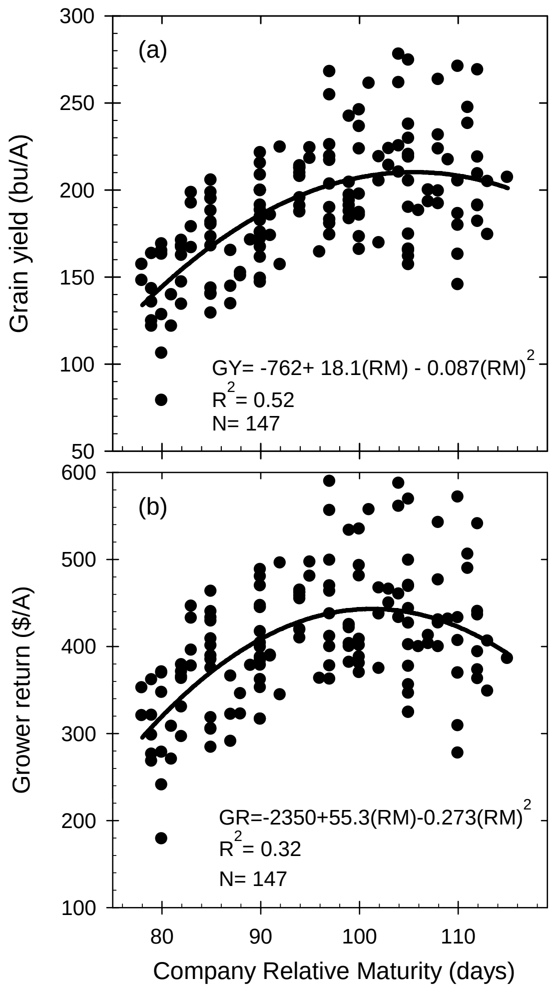

Figure 1. The relationship of relative maturity with a) grain yield and b) grower return ($2.50 corn price, on-farm drying) at Arlington, WI (1995-2004).

Table 1. Optimum relative maturity (days RM) for grain yield at various locations in WI.

Location	Years tested	Optimum RM
Arlington	1995-2004	106
Janesville	1996-1997	107
Lancaster	1996-1997	112
Fond du Lac	1996-1997	103
Hancock	1995-2004	104
Chippewa Falls	1999-2001	104
Marshfield	1999-2004	---
Seymour	1999-2001	102
Valders	1999-2001	---

Table 2 . Optimum relative maturity (days RM) for three corn production systems.

System:Drying Cost	Grain price ($/bu)			
($ / point bu)	$2.00	$2.50	$3.00	PEPS
Arlington, WI				
Commercial:$0.04	--	98	99	98
On-Farm:$0.02	100	101	102	101
Livestock:$0.00	106	106	106	107
Janesville, WI				
Commercial:$0.04	104	105	105	105
On-Farm:$0.02	106	106	106	106
Livestock:$0.00	107	107	107	108
Lancaster, WI				
Commercial:$0.04	106	112	112	112
On-Farm:$0.02	112	112	112	112
Livestock:$0.00	112	112	112	112
Fond du Lac, WI				
Commercial:$0.04	--	---	99	99
On-Farm:$0.02	100	101	101	101
Livestock:$0.00	103	103	103	103
Hancock, WI				
Commercial:$0.04	--	--	98	--
On-Farm:$0.02	100	100	101	100
Livestock:$0.00	104	104	104	103
Chippewa Falls, WI				
Commercial:$0.04	--	--	97	--
On-Farm:$0.02	98	99	100	98
Livestock:$0.00	104	104	104	104
Marshfield, WI				
Commercial:$0.04	89	90	91	89
On-Farm:$0.02	92	93	93	92
Livestock:$0.00	--	--	--	--
Seymour, WI				
Commercial:$0.04	--	--	97	--
On-Farm:$0.02	98	99	99	98
Livestock:$0.00	102	102	102	101
Valders, WI				
Commercial:$0.04	--	--	--	--
On-Farm:$0.02	--	--	--	--
Livestock:$0.00	--	--	--	--

Planting date

Understanding your farm growing season (first and last frost dates, GDU accumulation, planting date, etc.) and field characteristics (slope, aspect, soil texture, surface residue, etc.) will help in selecting adapted hybrids. Plant full-season hybrids first followed by shorter-season hybrids on dates that ensure maturity before fall frost. If planting is delayed, switch to shorter-season hybrids.