



# Planting Effective Cover Crops by using High Yield Early Maturity Corn Hybrids for Silage

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### Significant Findings:

- Early planting of cover crops to achieve 1100 fall GDDs is necessary to maximize end-of-season N accumulation.
- Early maturity hybrids must be planted early for early planting of cover crops.
- Yield of early maturity hybrids was similar to late hybrids on average in most years.
- Yield of early hybrids was similar to late at varying planting dates.
- Planting earlier hybrids may increase or maintain nutritional quality without lowering silage yield.

### Background:

- A recent survey of dairy farms conducted by UMass Extension showed there were multiple options to refine or optimize nutrient management planning and on-farm feed production.
  - Our focus is on a farm system approach emphasizing early maturity corn hybrids for silage, early planting of corn, and cover crops for maximizing end-of-season nitrogen accumulation.
  - Field experiments were conducted over several years mostly at the UMass Research Farm in Deerfield, MA.
- Cover Crops:**
- Cover crop images from Deerfield, MA on Dec. 31, 2006.
  - End-of-season N accumulation is only achieved with early planted cover crops (Fig. 1).
  - Recommended seeding date for erosion control (Sept. 15) maybe 1-2 weeks too late for optimum N accumulation.

### Earlier Maturing Corn Hybrids:

- Planting early hybrids helps ensure an earlier harvest, and thus a better opportunity to timely seed a cover crop for end-of-season N accumulation.
  - Seven years of field studies at the UMass Research Farm have shown that yield of early hybrids was similar to late hybrids (Table 1).
  - One of three locations in 2008 showed an advantage to later maturing hybrids (Figs 9-11).
  - In all maturity groups there are high and lower yielding hybrids of varying quality (Figs. 5, 8 -11). Hybrids were not always consistently high yielding at differing sites.
  - Planting early hybrids may increase nutritional quality without lowering silage yield.
- Planting Date:**
- Delayed planting reduced yield more than the differences in yield between early and late maturing hybrids (Figs. 3, 4, 6, 7).
  - Yield of early maturity hybrids was similar to late at varying planting dates for silage and ear yield (Figs. 3, 4, 6, 7).
  - Delayed planting delayed harvesting and thus the date for seeding cover crop (Fig. 2).

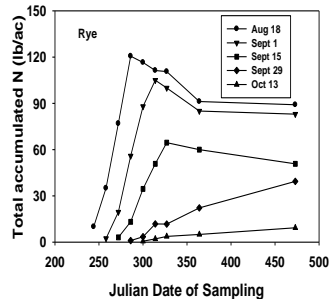


Figure 1. N accumulation by rye seeded August to October.

Table 1. Average yields of early and late maturing hybrids.

Year	Early Hybrids	Late Hybrids
2002	26.0* (10) <sup>n</sup>	26.6 (19)
2003	30.4 (18)	29.4 (7)
2004	21.8 (11)	22.8 (14)
2005	29.1 (6)	27.9 (12)
2006	30.0 (7)	32.0 (13)
2007	29.6 (14)	30.2 (7)
2008	35.0 (7)	36.4 (10)
Avg. <sup>a</sup>	28.6	28.7

\*Ton/acre <sup>n</sup>Number of hybrids

<sup>a</sup>Weighted Average

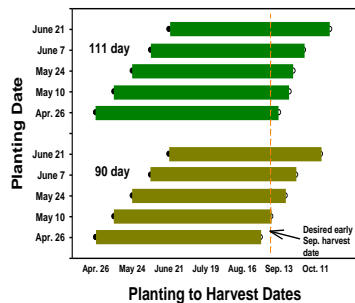


Figure 2. Planting and harvest dates for an early and late maturing corn hybrid.

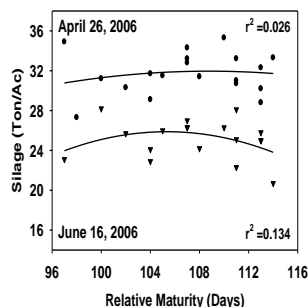


Figure 3. Silage yield of corn hybrids on two planting dates.

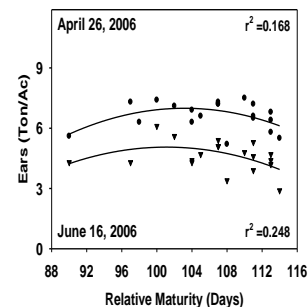


Figure 4. Earcorn yield of hybrids on two planting dates.

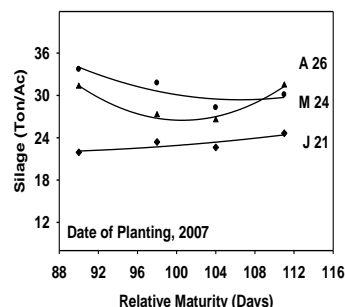


Figure 6. Silage yield of corn hybrids on three planting dates.

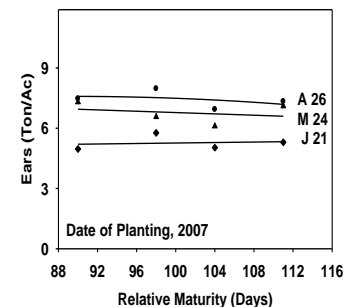


Figure 7. Earcorn yield of hybrids on three planting dates.

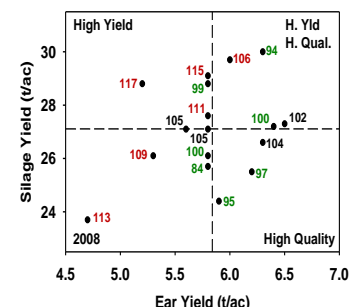


Figure 9. Mean yield of corn hybrids at a cooperating farm in eastern Mass.

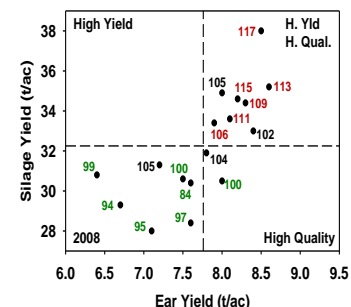


Figure 10. Mean yield of corn hybrids at a cooperating farm in western Mass.

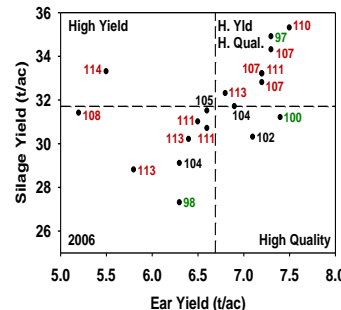


Figure 5. Mean yields of corn hybrids at the UMass Farm in 2006. Dash lines reference means of hybrid yields for silage and ears. #s refer to days of relative maturity.

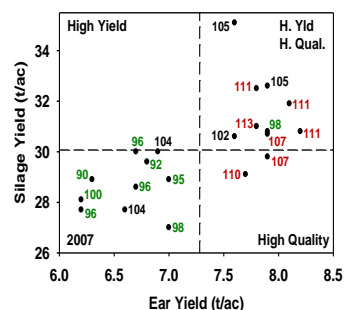


Figure 8. Mean yields of corn hybrids at the UMass Farm in 2007. Dash lines reference means of hybrid yields for silage and ears. #s refer to days of relative maturity.

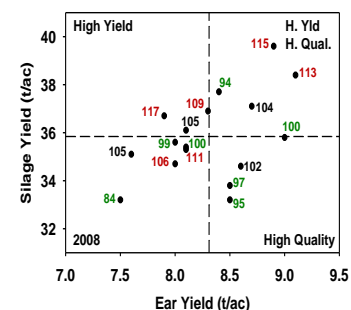


Figure 11. Mean yields of corn hybrids at the UMass Farm in 2008. Dash lines reference means of hybrid yields for silage and ears. #s refer to days of relative maturity.