Polymer Seed Coatings for Early Planting of Hybrid Corn in Indiana?

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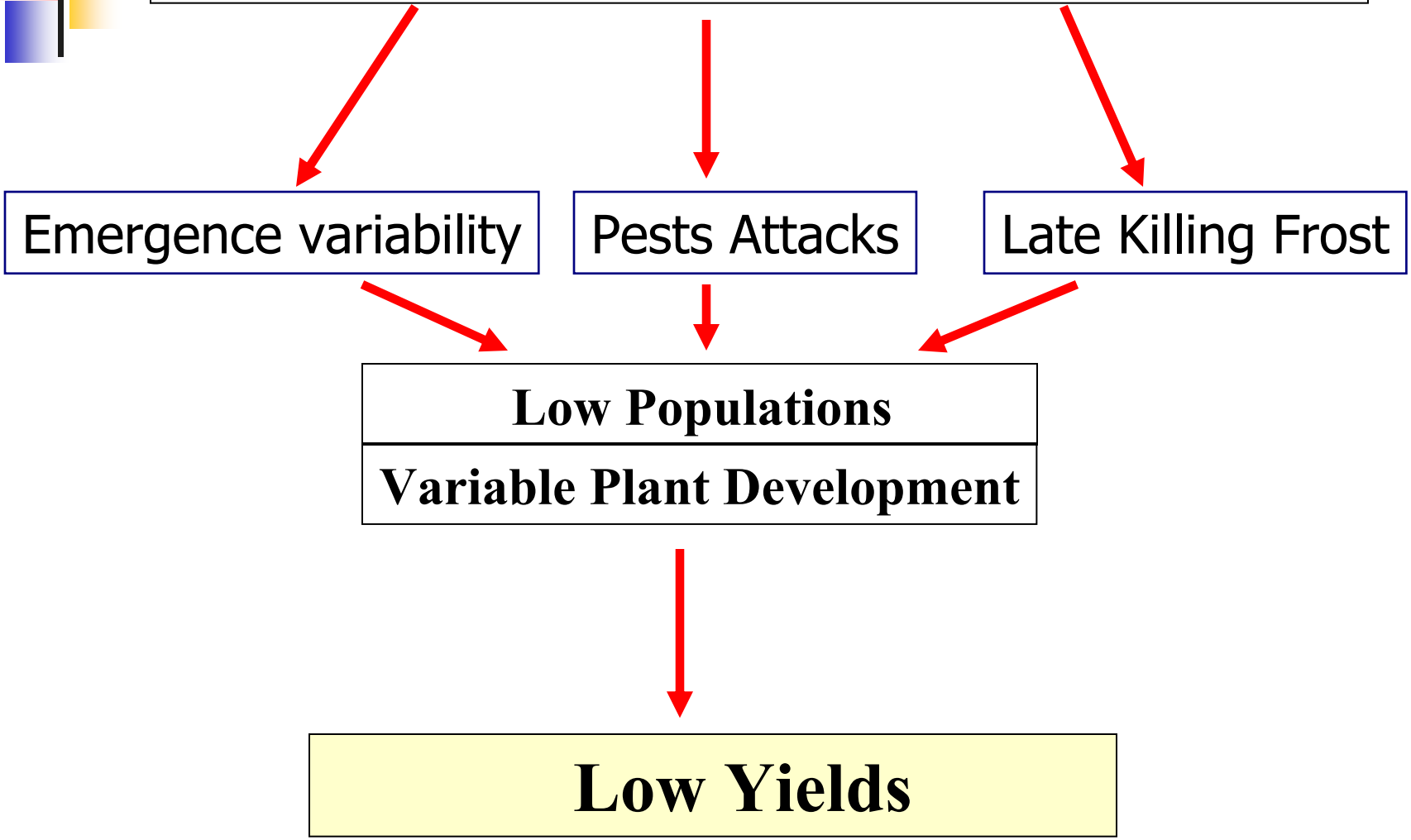
Risks of Early Planting of Corn



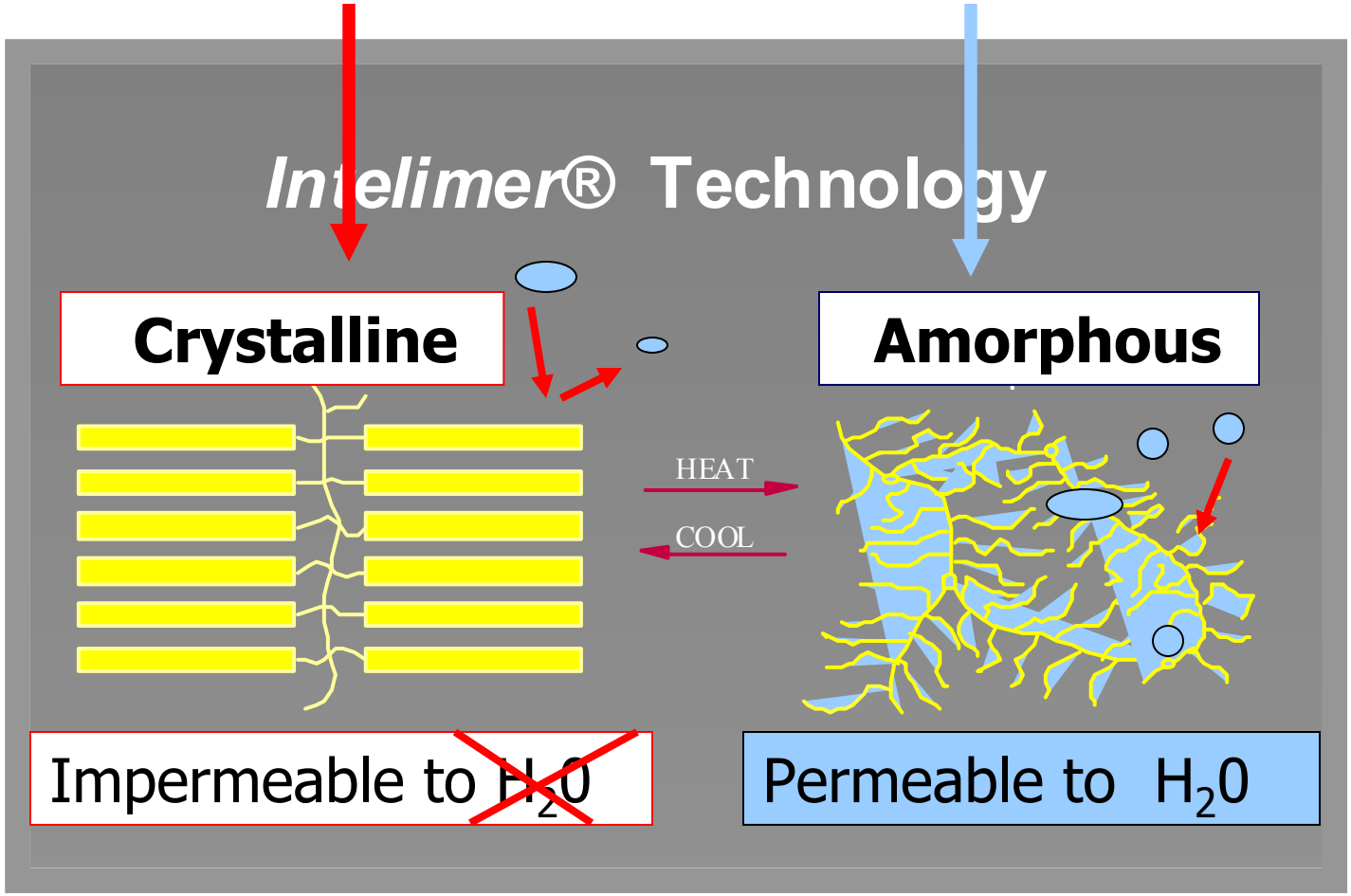
Expected Grain Yield Due to Various Planting Dates and Final Plant Populations

Planting Date	Plants (000 acre^{-1}) 20	30
	Yield (%)	
10-Apr	85	94
15-Apr	88	97
20-Apr	90	99
25-Apr	92	100
30-Apr	92	100
5-May	91	99
10-May	89	97
15-May	87	95
20-May	83	91
25-May	79	87
30-May	73	81

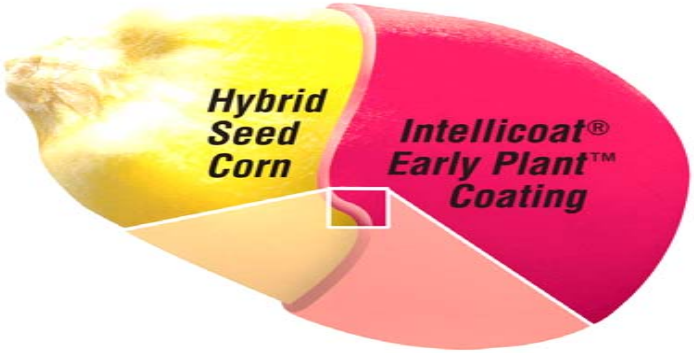
Optimum Planting Period

Source: Nafziger (1994)

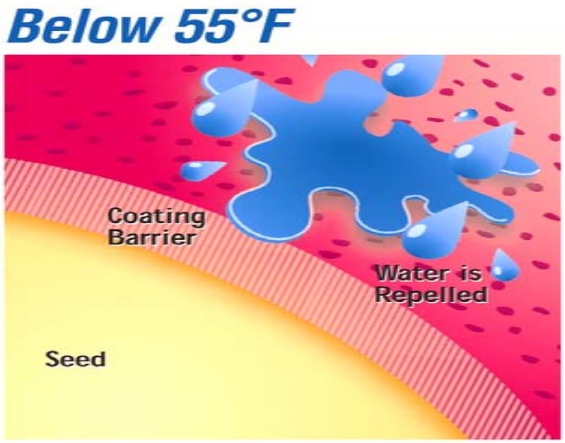
Temperature-activated Polymers behave in two ways

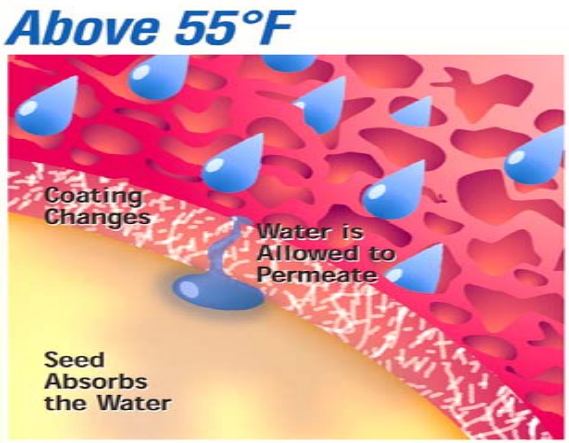


Early Plant™ Technology



It knows when to grow !





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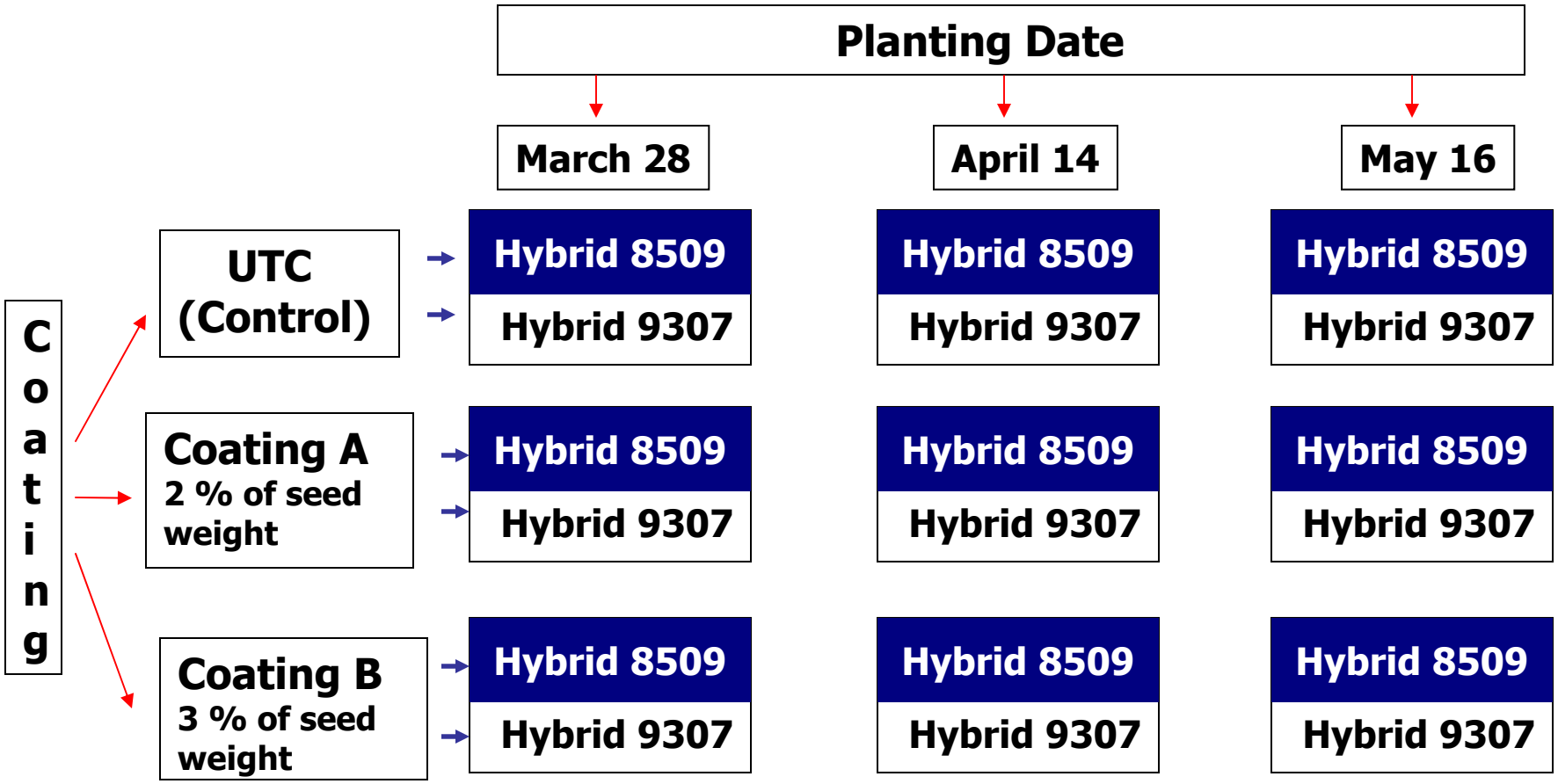
"Pollinator Plus" Male Parent Delay

Corn Producer Profile for Early Plant Option?

1. Variable drainage and in Central or Eastern Corn Belt
2. No-till production system
3. Acreage expanding, but planting capability limited
4. Risk adverse to high rainfall in optimum planting period
5. Determined to plant soybean early, and harvest corn early

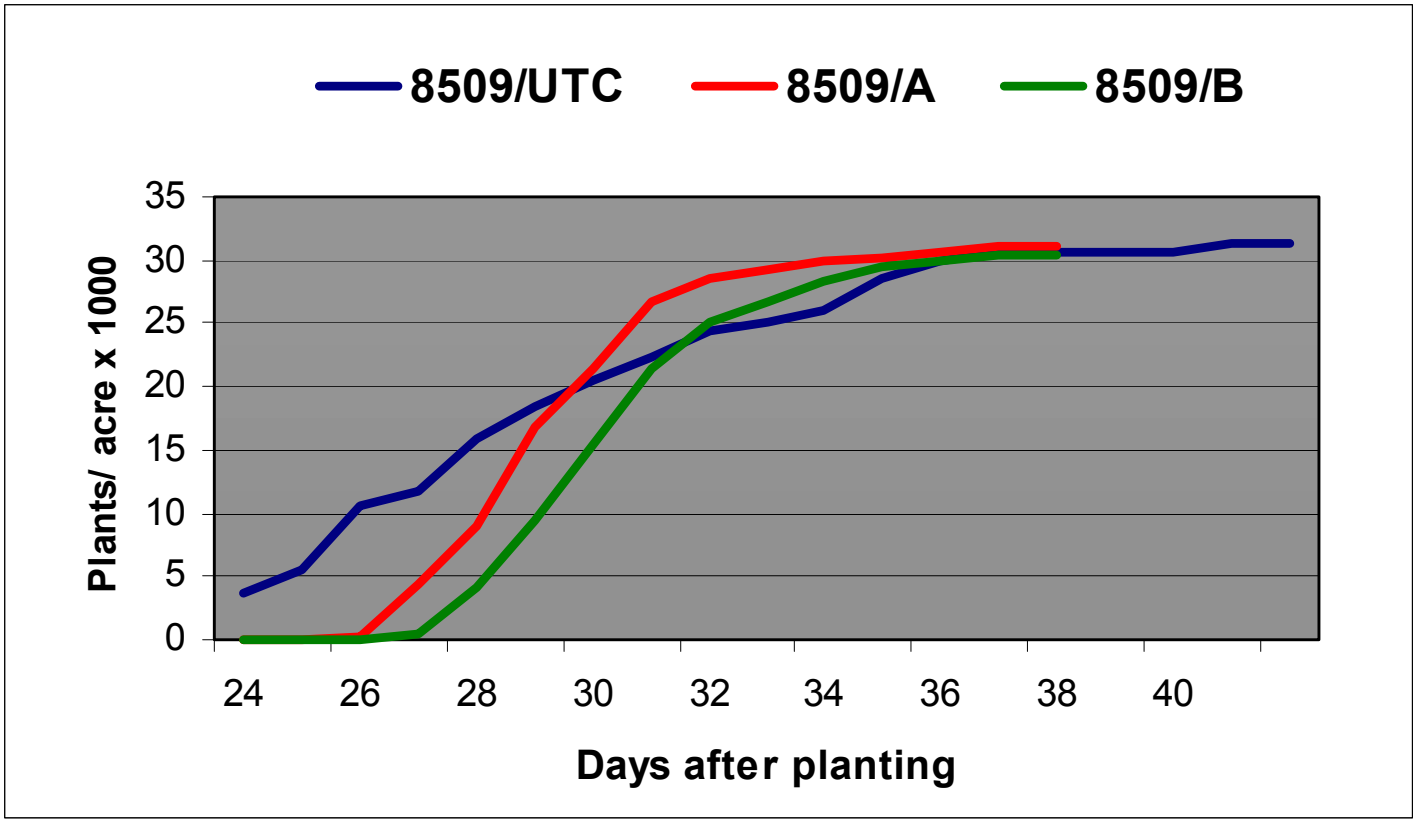
Results in Year 2000

Experimental Design in Year 2000



Emergence Profile (2000)

Planting Date: March 28



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Emergence Profile (2000)

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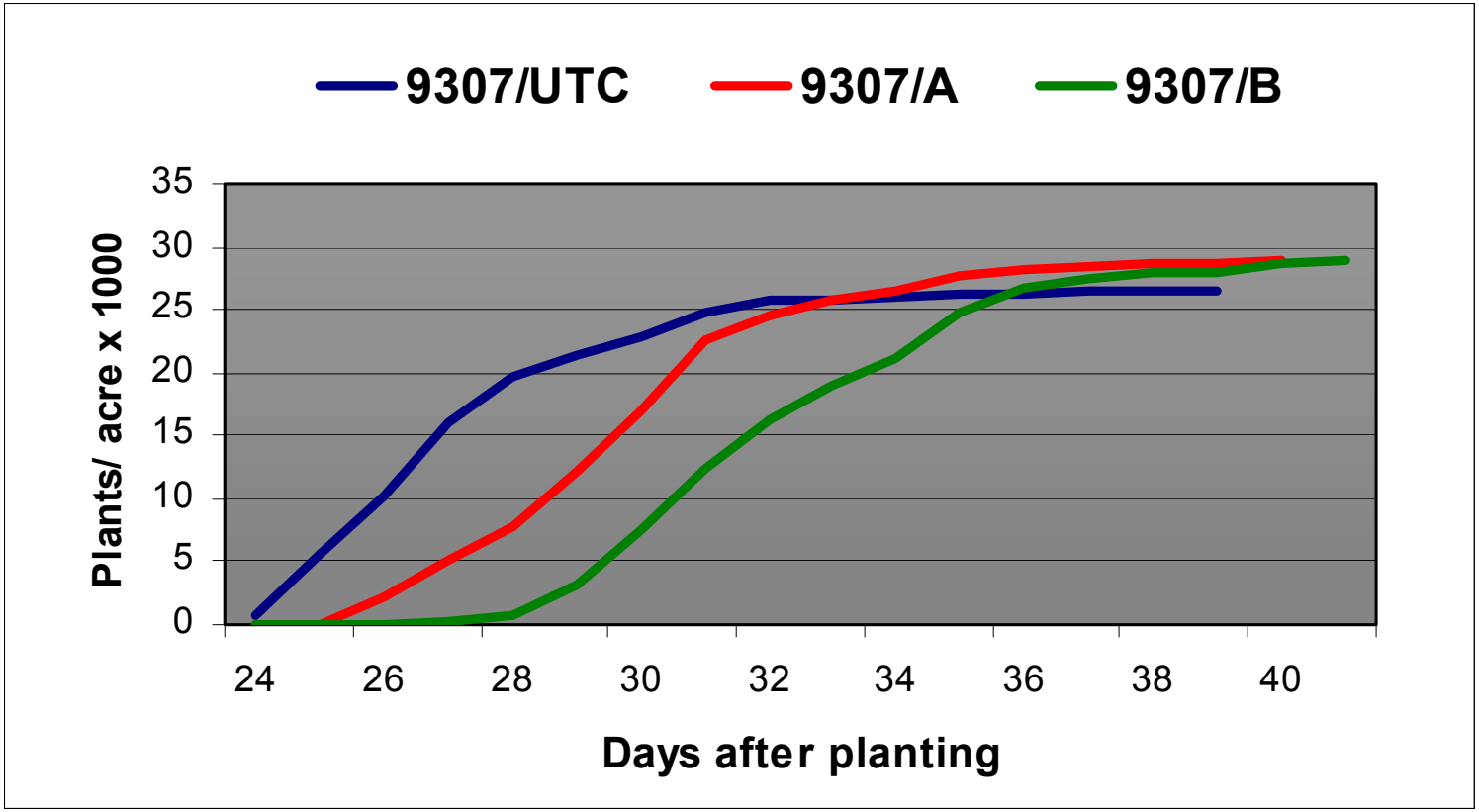

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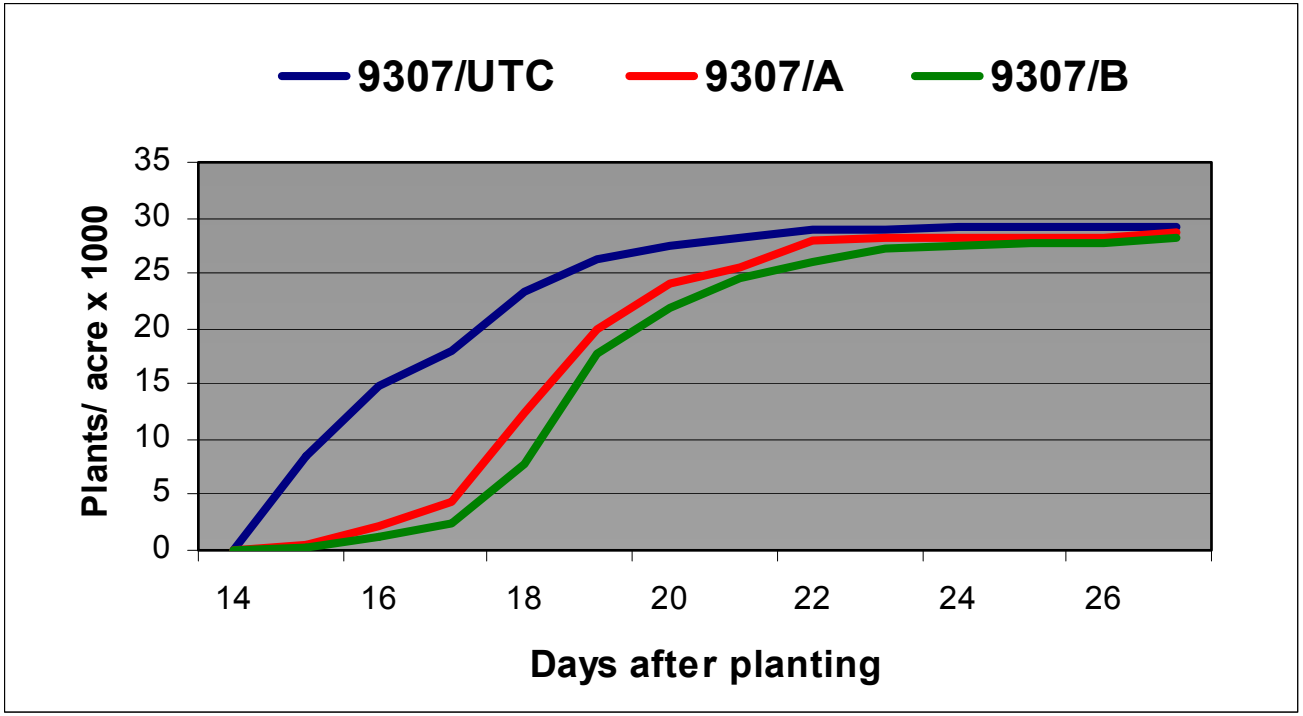
Emergence Profile 2000

Planting Date: April 14



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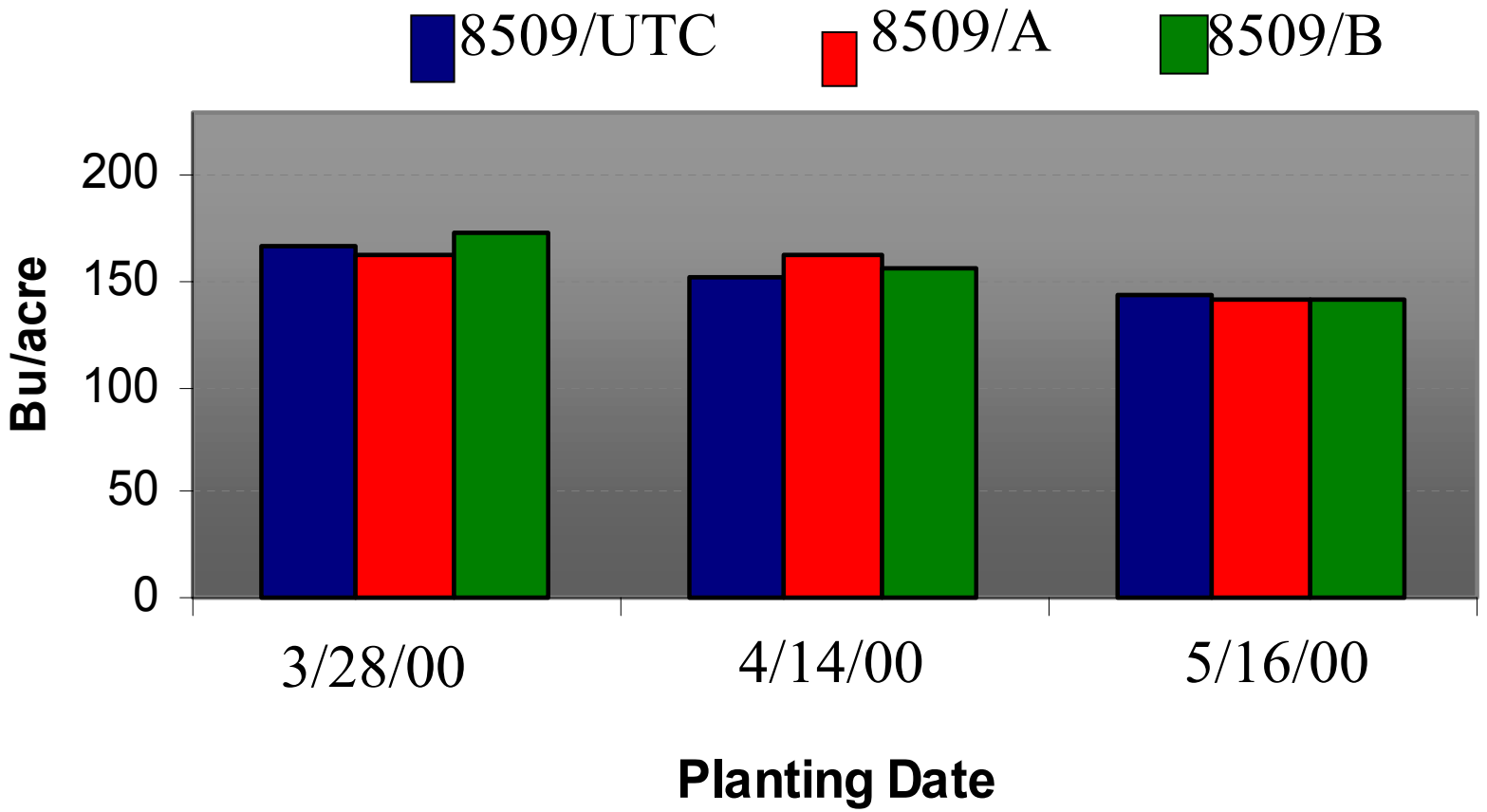
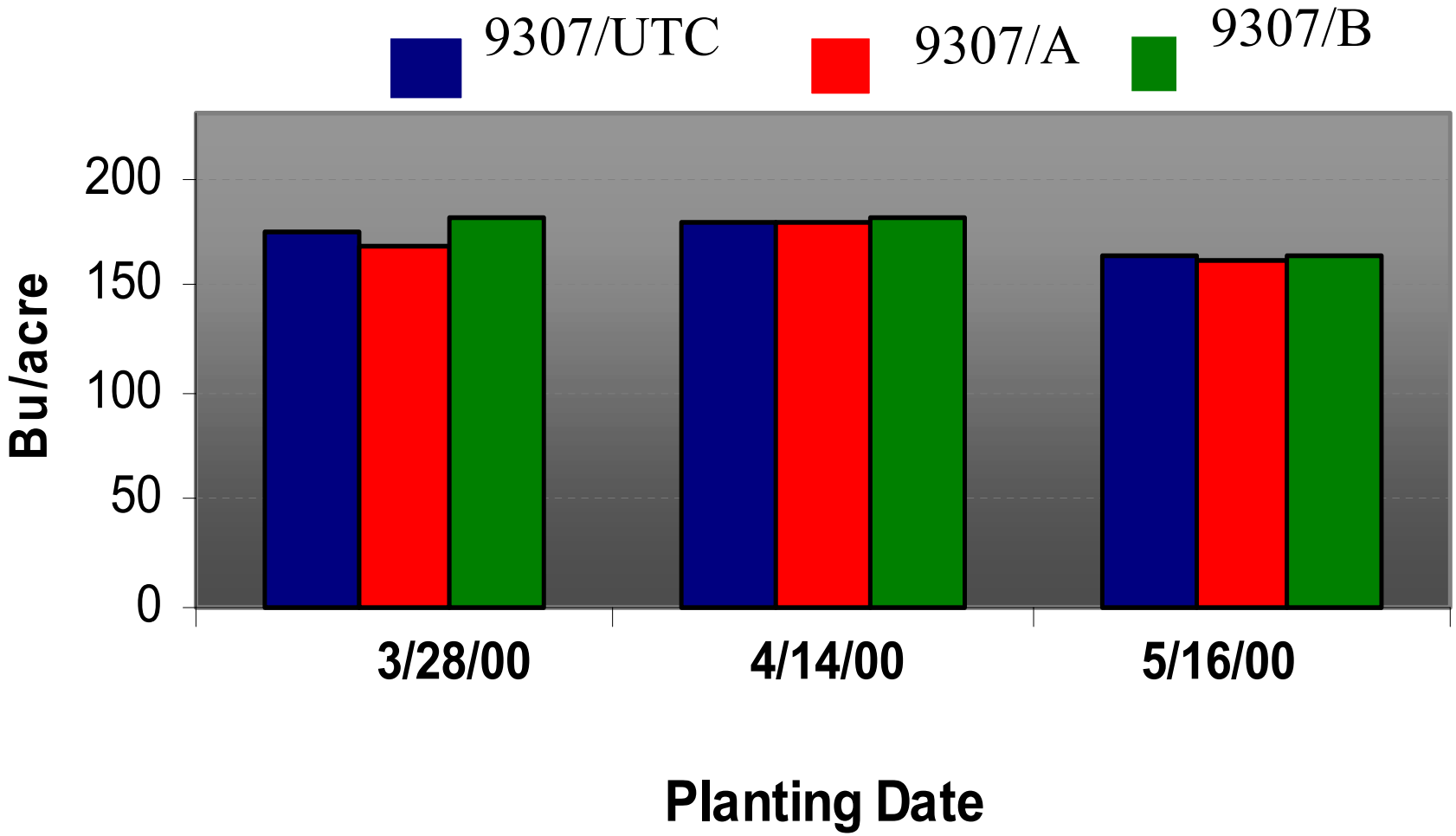
Polymer Coatings and Yield 2000

Lafayette, IN



Polymer Coatings and Yield (2000)

Lafayette, IN

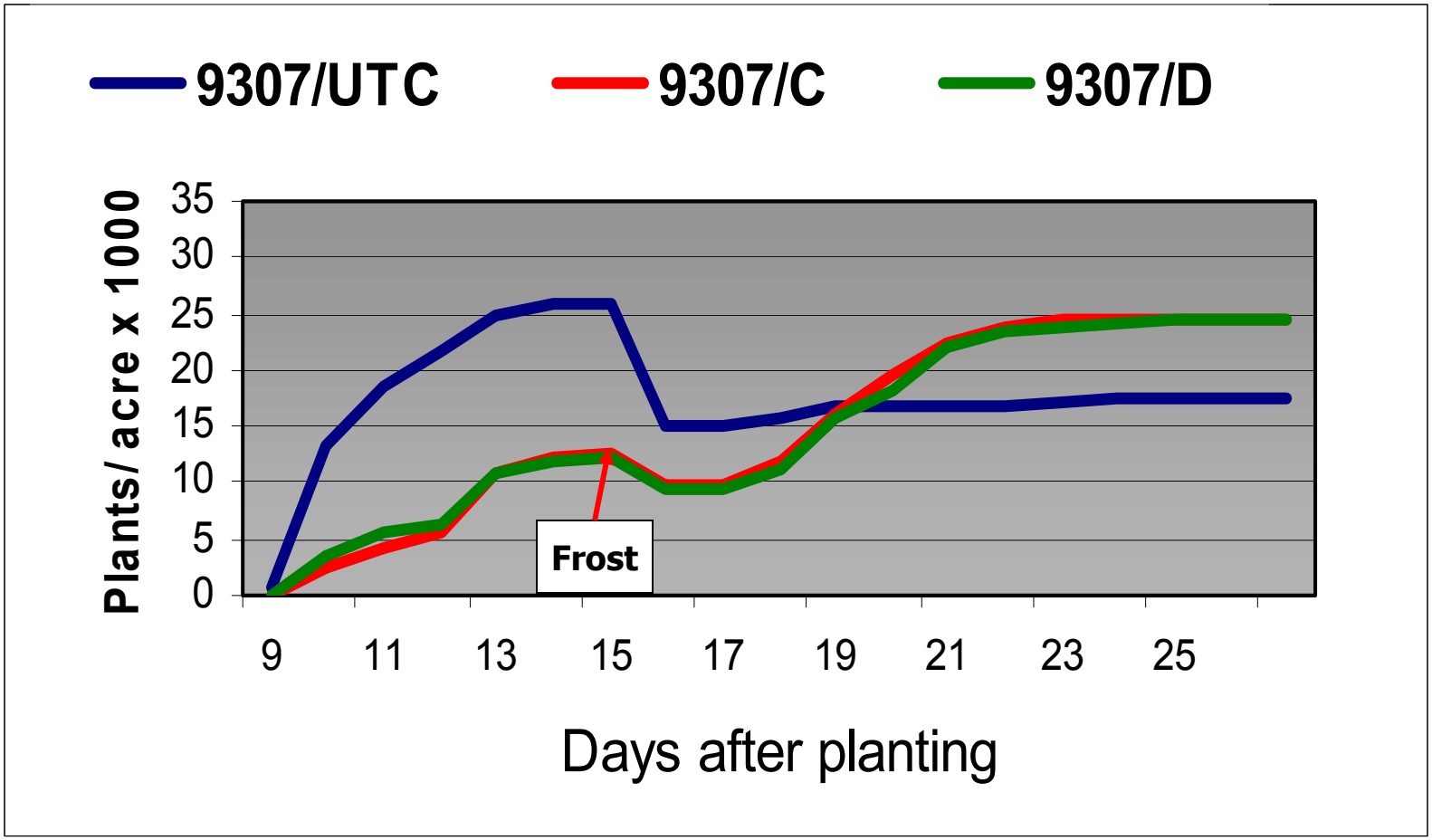


Results in Year 2001

Killing Frosts on April 17 and 18

Emergence Profile based on Surviving Seedlings (2001)

Planting Date: April 2



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Hybrid 9307/UTC

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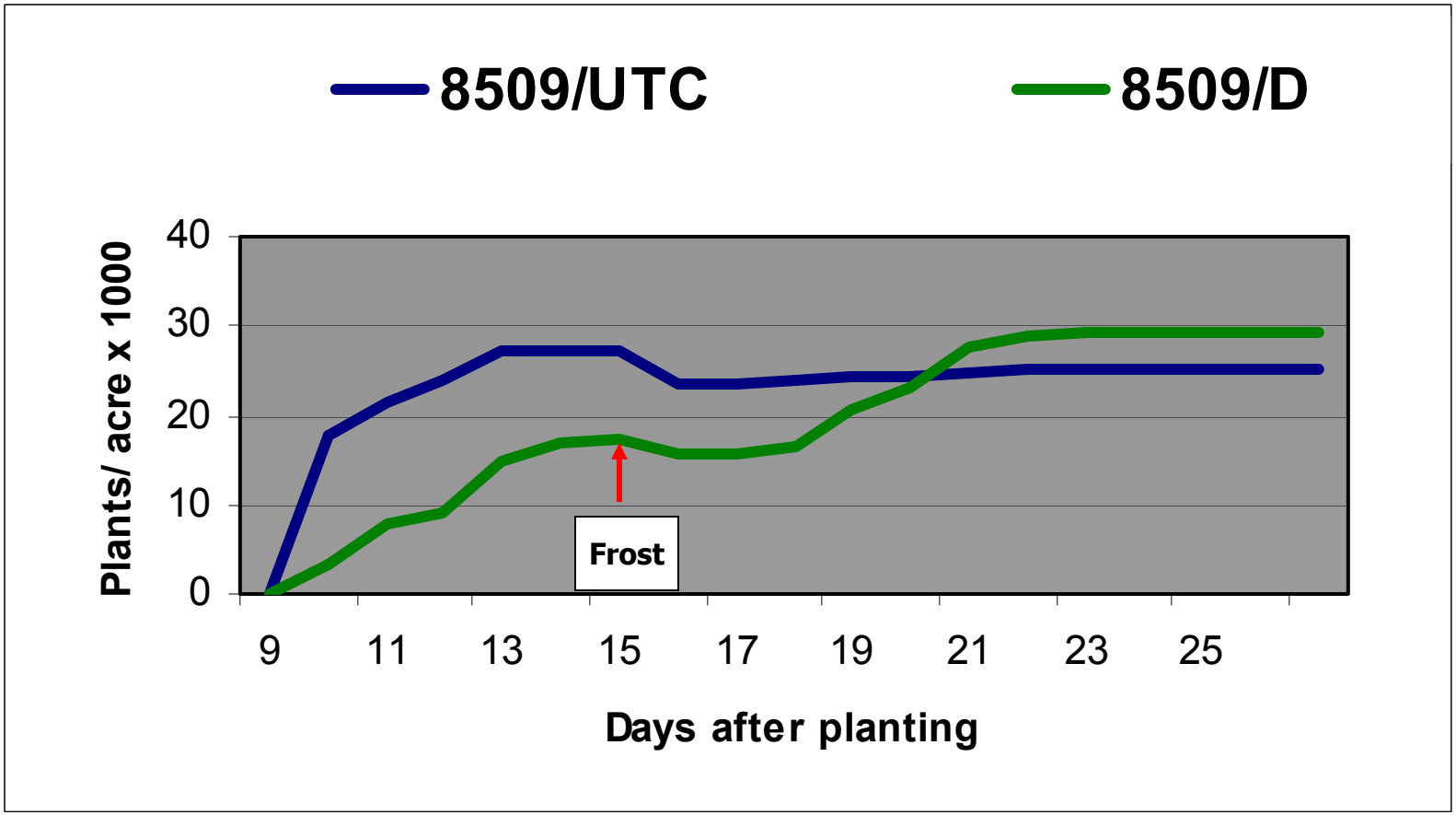
Emergence Profile based on Surviving Seedlings (2001)

Planting Date: April 2



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Final Plant Populations (Lafayette, IN)

Treatment	Plant Population (Plants/acre) Planting Date		
Year 2000	**3/28/2000**	**4/14/2000**	**5/16/2000**
9307/UTC	27200	28700	26600
9307/A	28700	28700	27400
9307/B	29000	28200	26900
8509/UTC	31300	31600	30500
8509/A	30900	31900	29600
8509/B	30400	31700	30400
Year 2001	**4/2/2001**	**4/19/2001**	**5/11/2001**
9307/UTC	17400 b	28500 a	30500 a
9307/C	24300 a	26000 b	28400 b
9307/D	23300 a	28200 a	30600 a
8509/UTC	25000 b	25700	30000
8509/D	29100 a	27400	30400

Means separation within planting date and hybrid by Duncan range test, 5% level.

Treatment code: UTC, control , A,B,C, and D are polymer coatings

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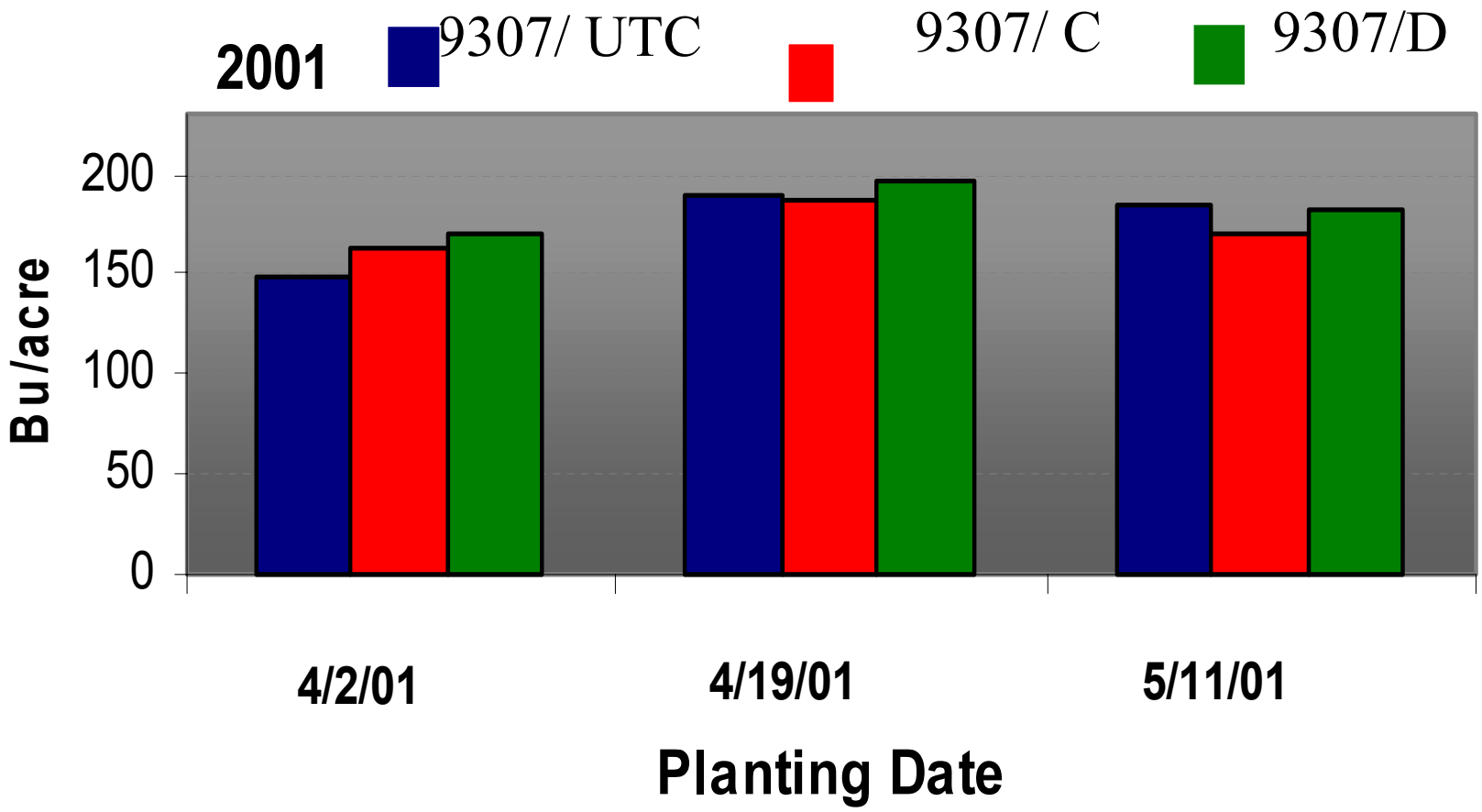
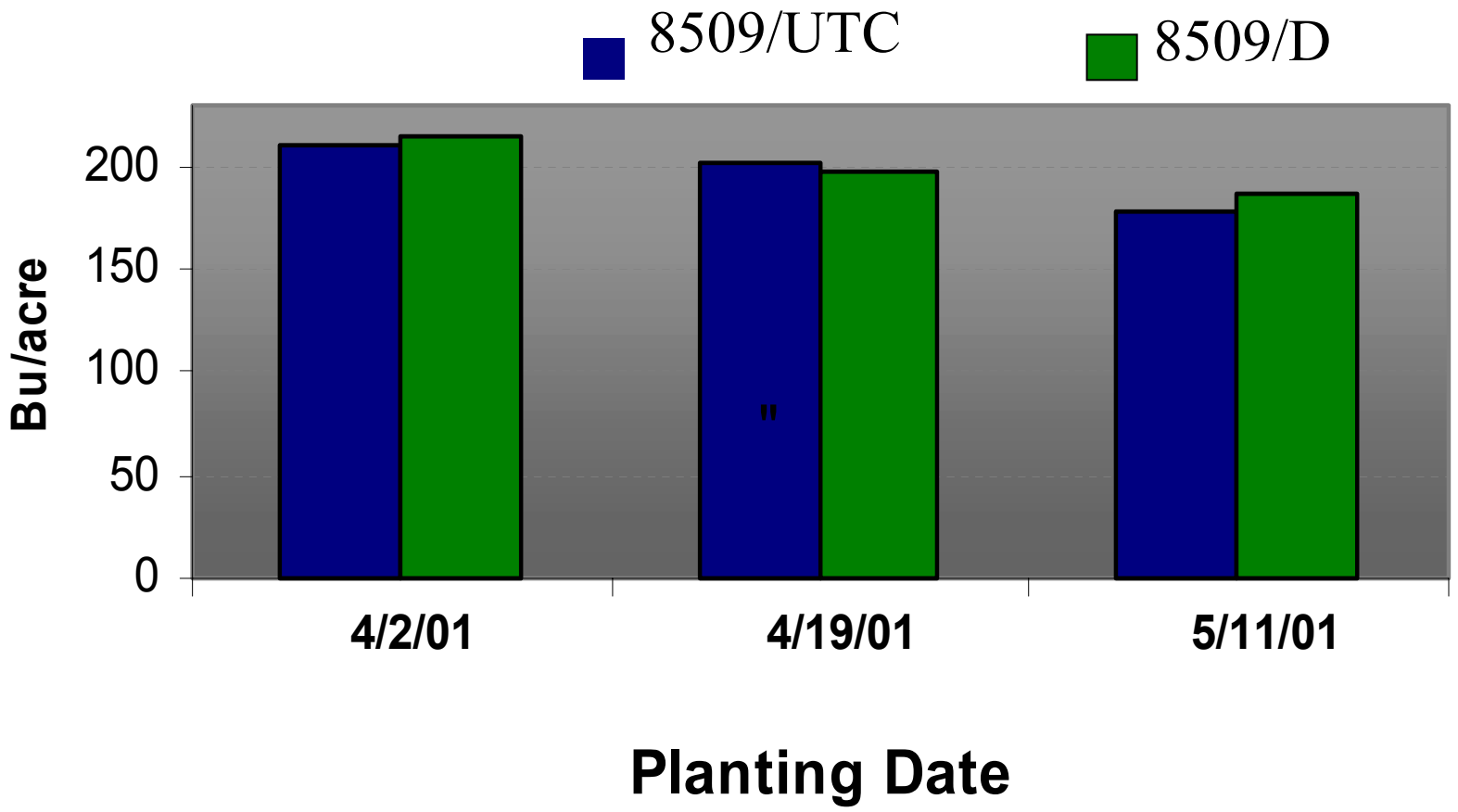
Polymer Coatings and Yield 2001

Lafayette, IN



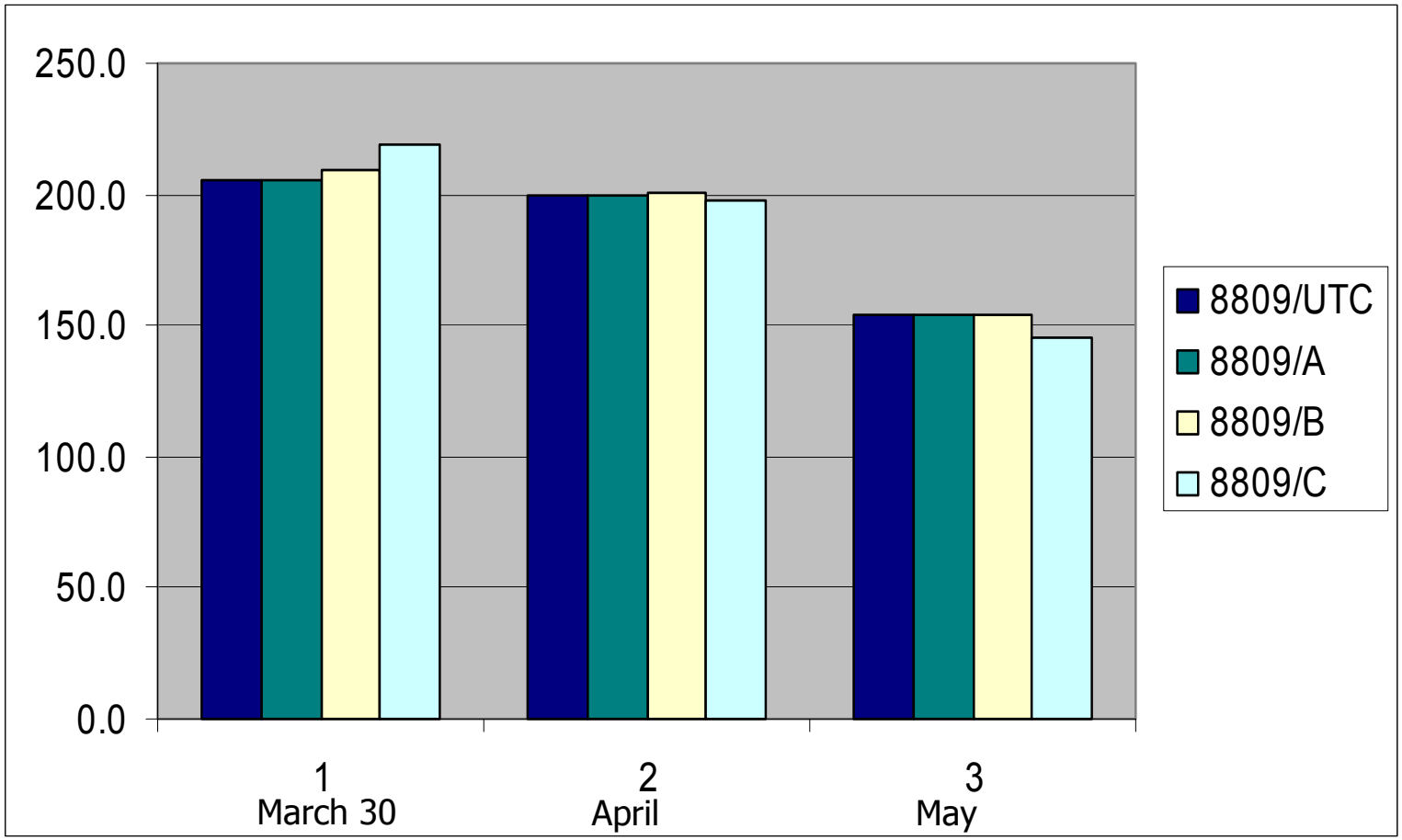
Polymer Coatings and Yields 2001

Lafayette, IN

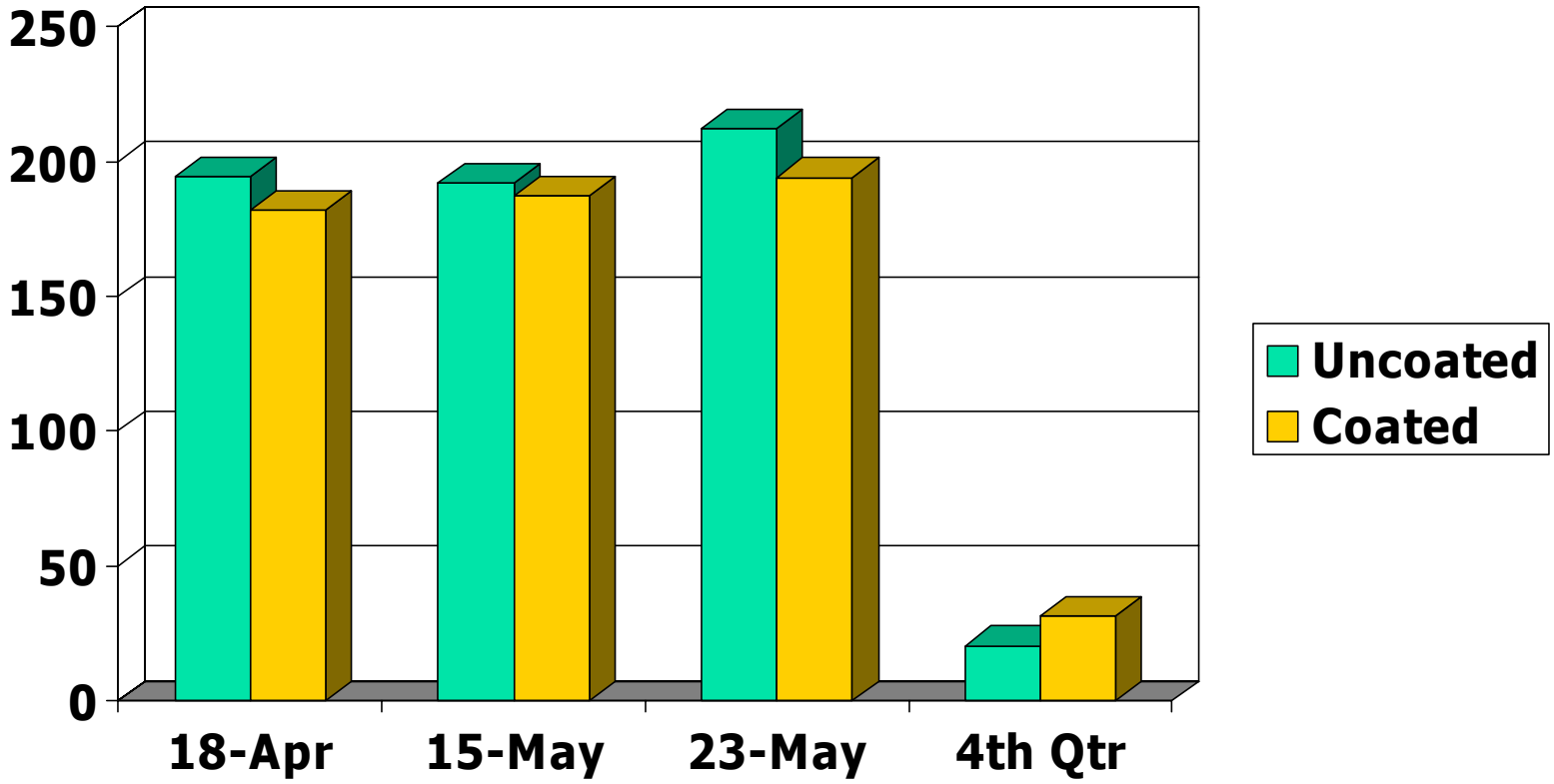


Polymer Coatings and Yields in 2001

Valparaiso, IN



Coating Effects on Yield in 2002
(average of 3 hybrids at West Lafayette, IN)



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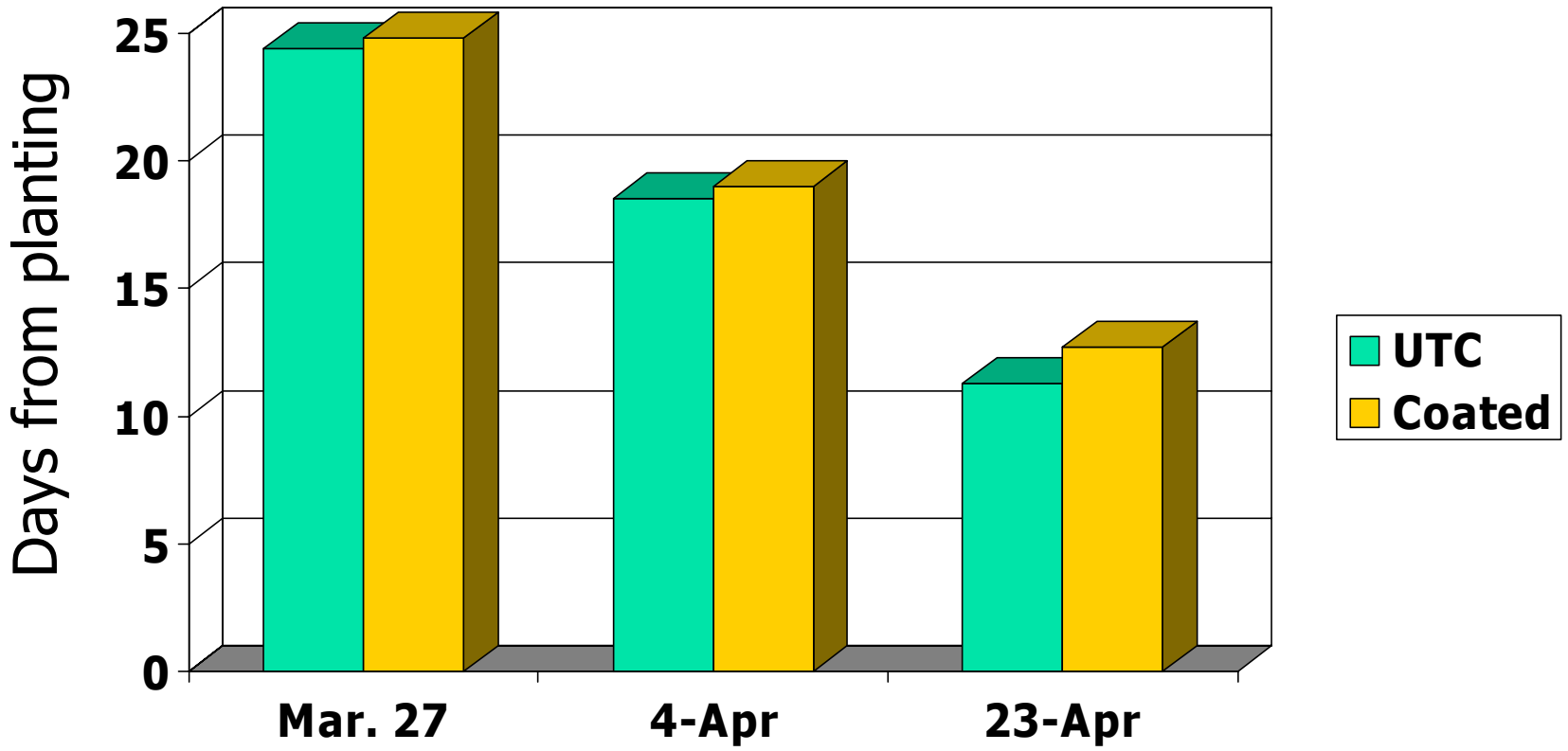
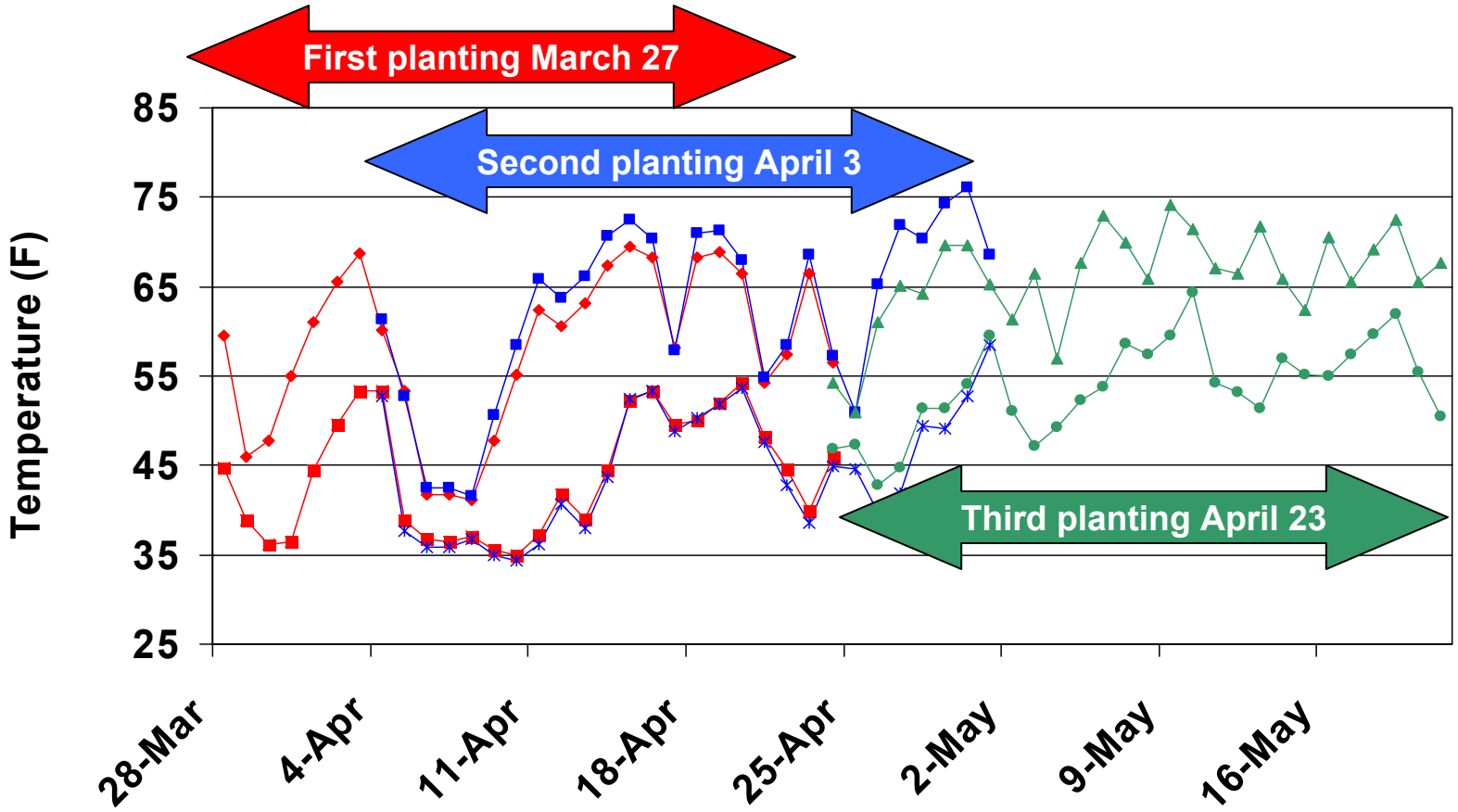
Coatings and Emergence Time in 2003 (average of 3 hybrids at West Lafayette)



Maximum and Minimum Soil Temperatures after Planting 2003 (West Lafayette)



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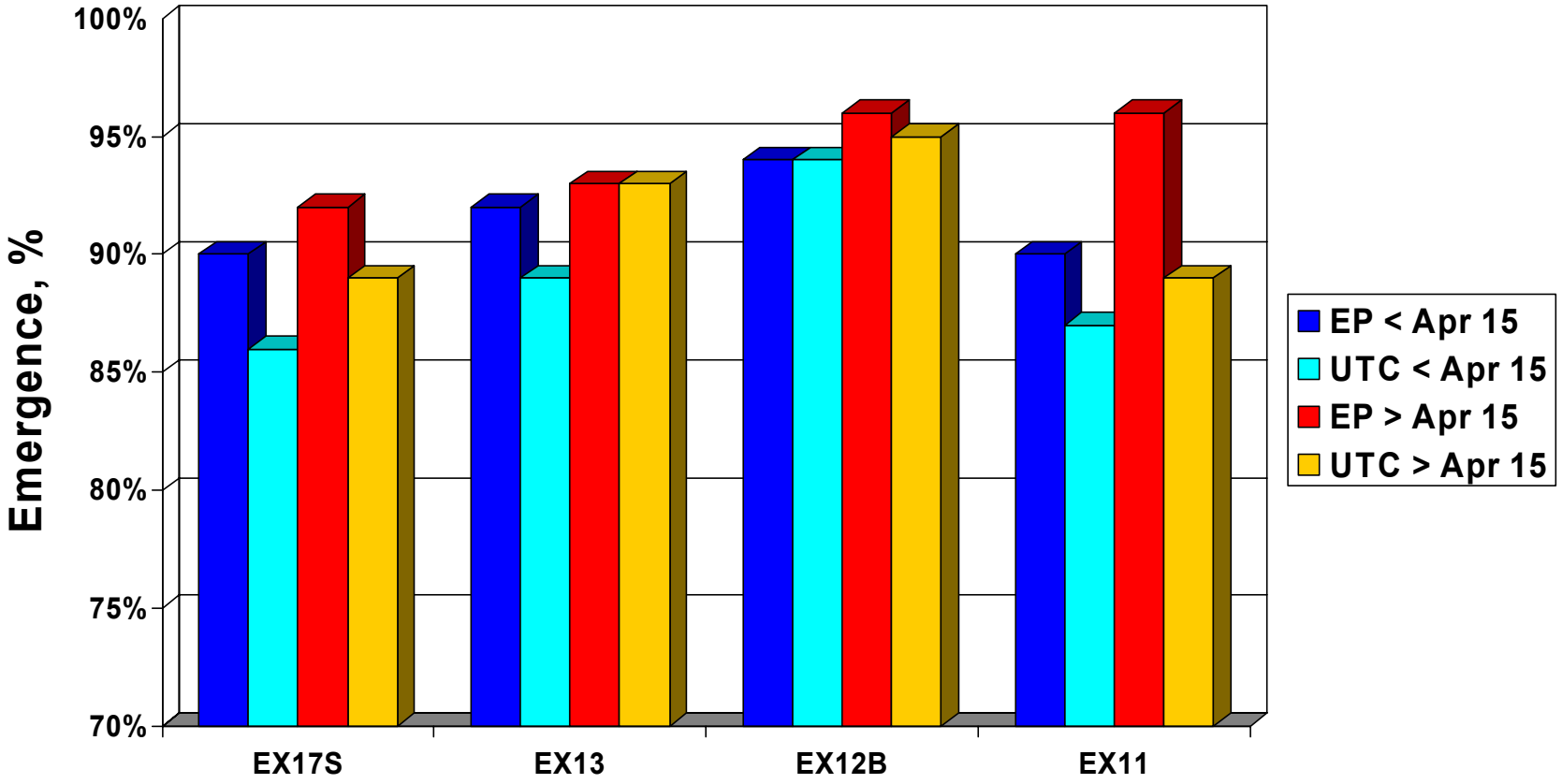
Comparison of early versus late planting in 2003

Planting date:<4/15 early, >4/15 late



Replicated Plot Trials: 6 locations, IN,IL,OH,MO

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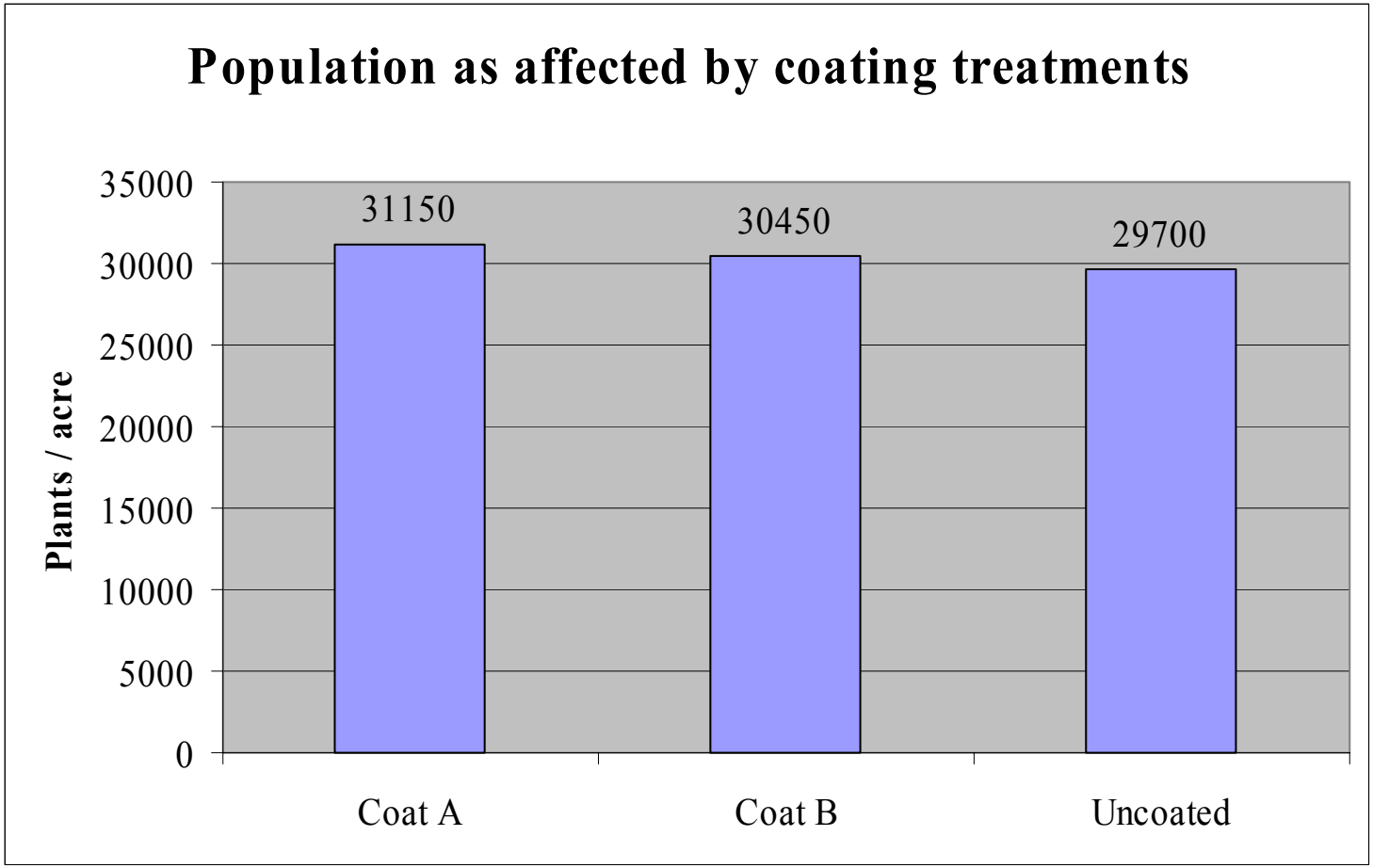
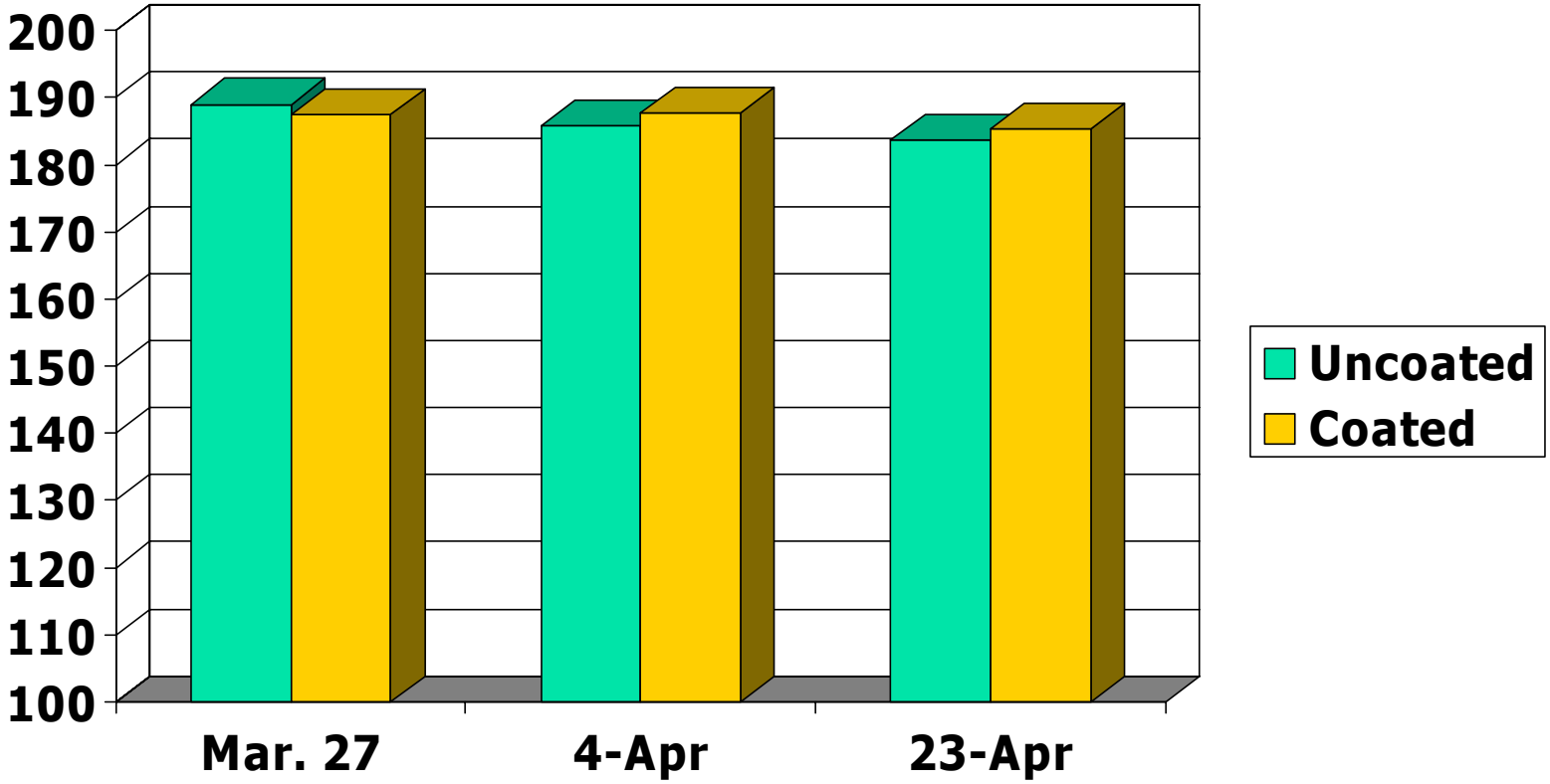
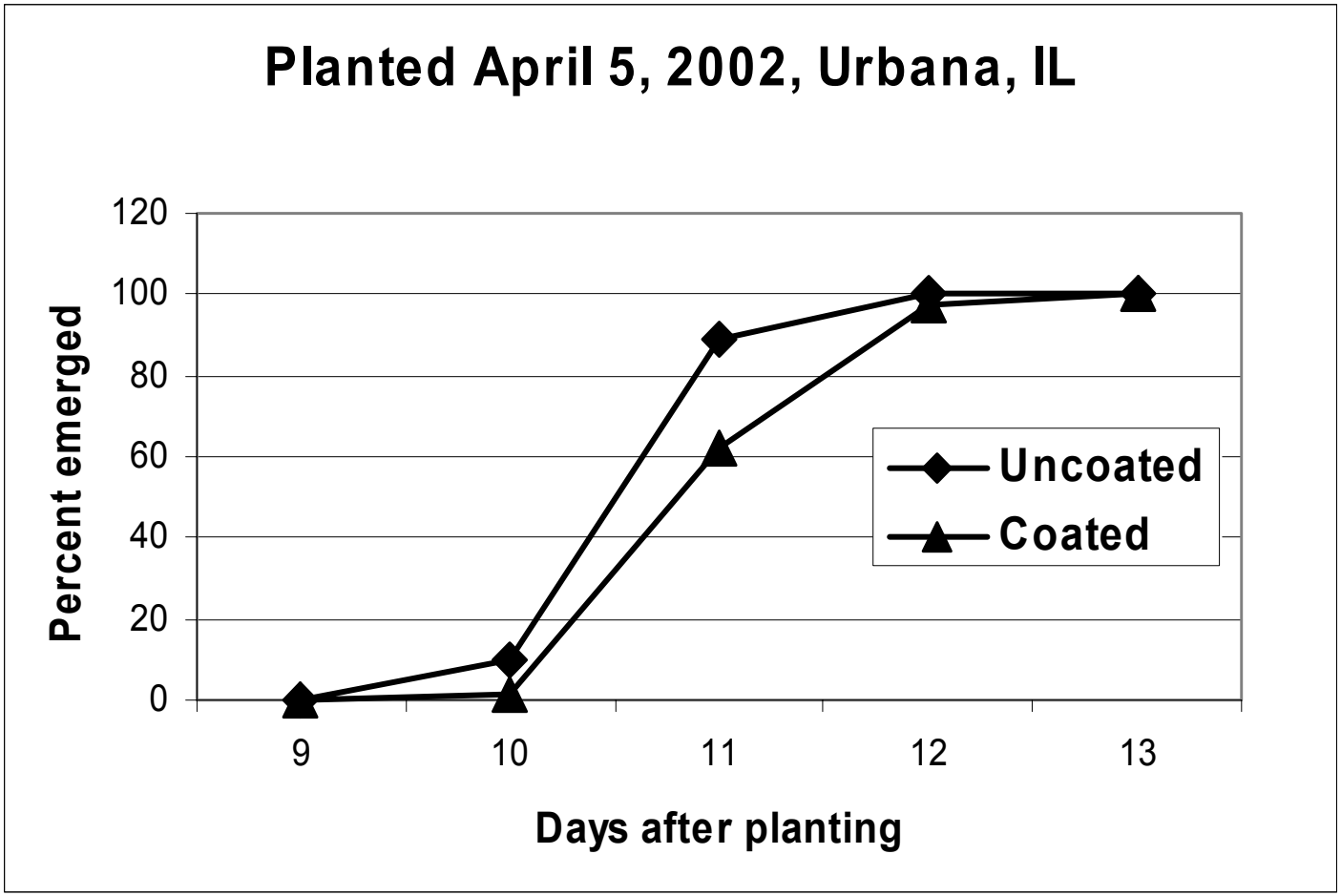
Coating Effects on Population in 2003
(Average of 3 hybrids and 3 planting dates at Wanatah, IN)



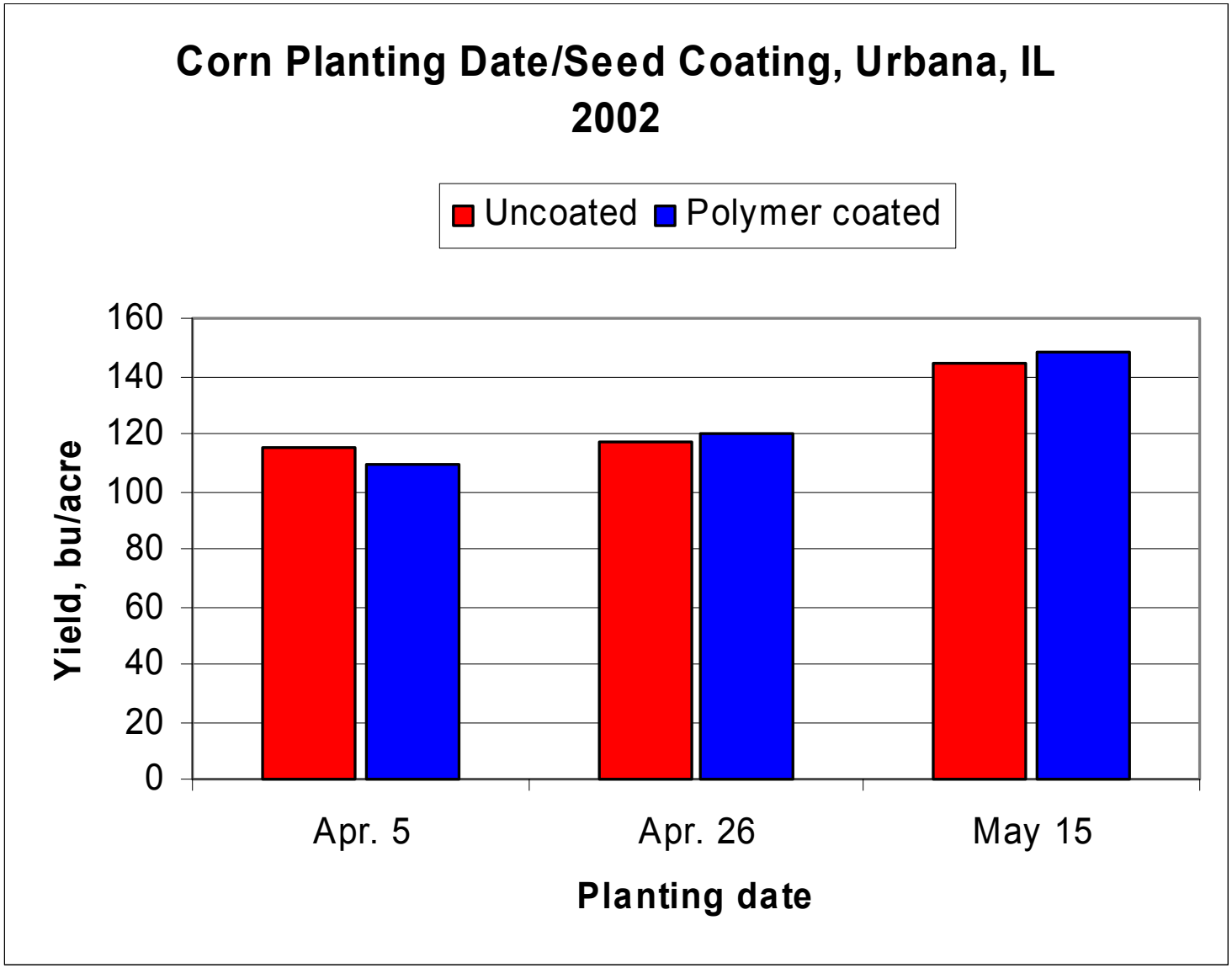
Coating Effects on Corn Yield in 2003 (mean of 3 hybrids at West Lafayette)



Polymer Studies in Illinois



Source: Dr. E. Nafziger



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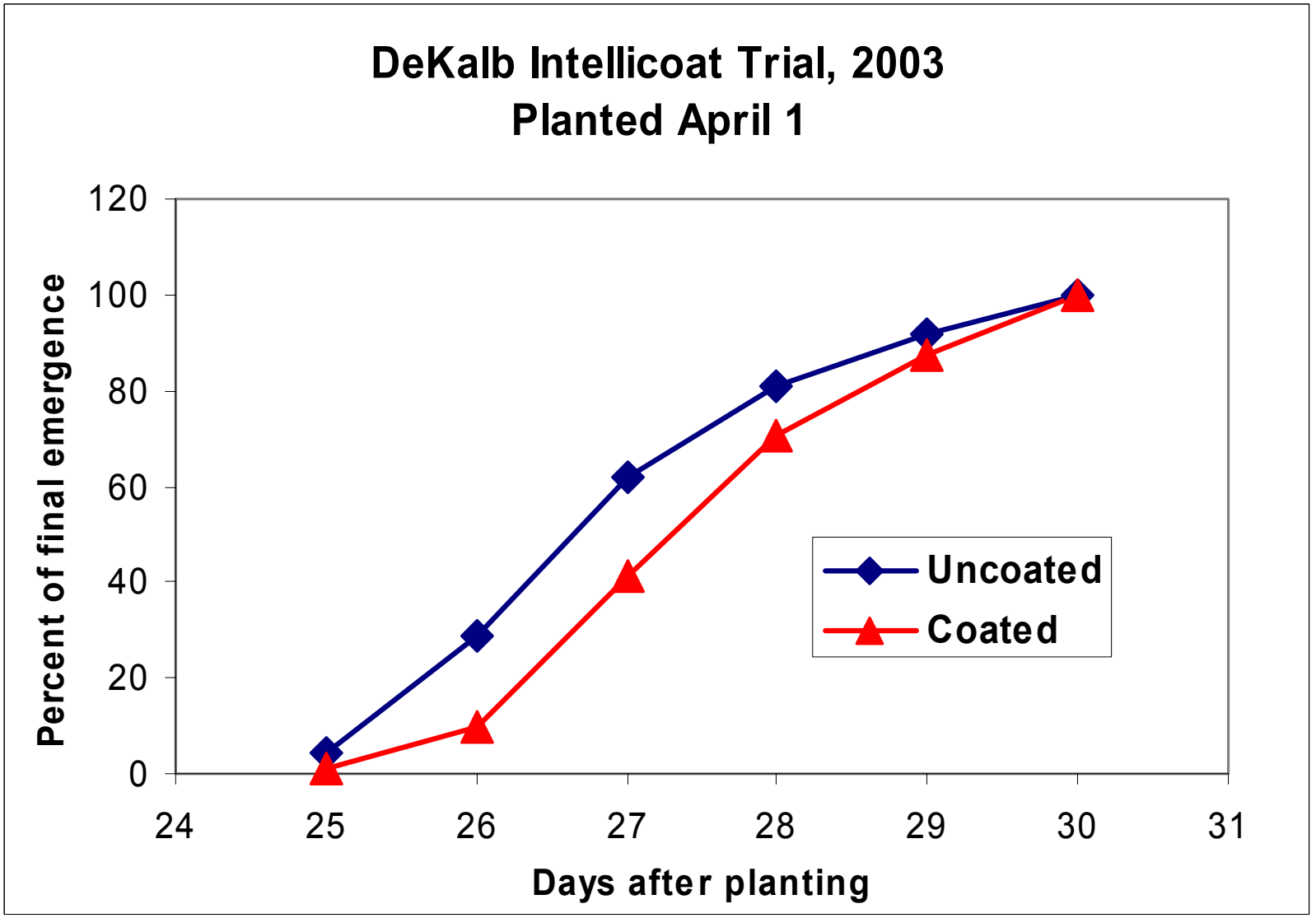

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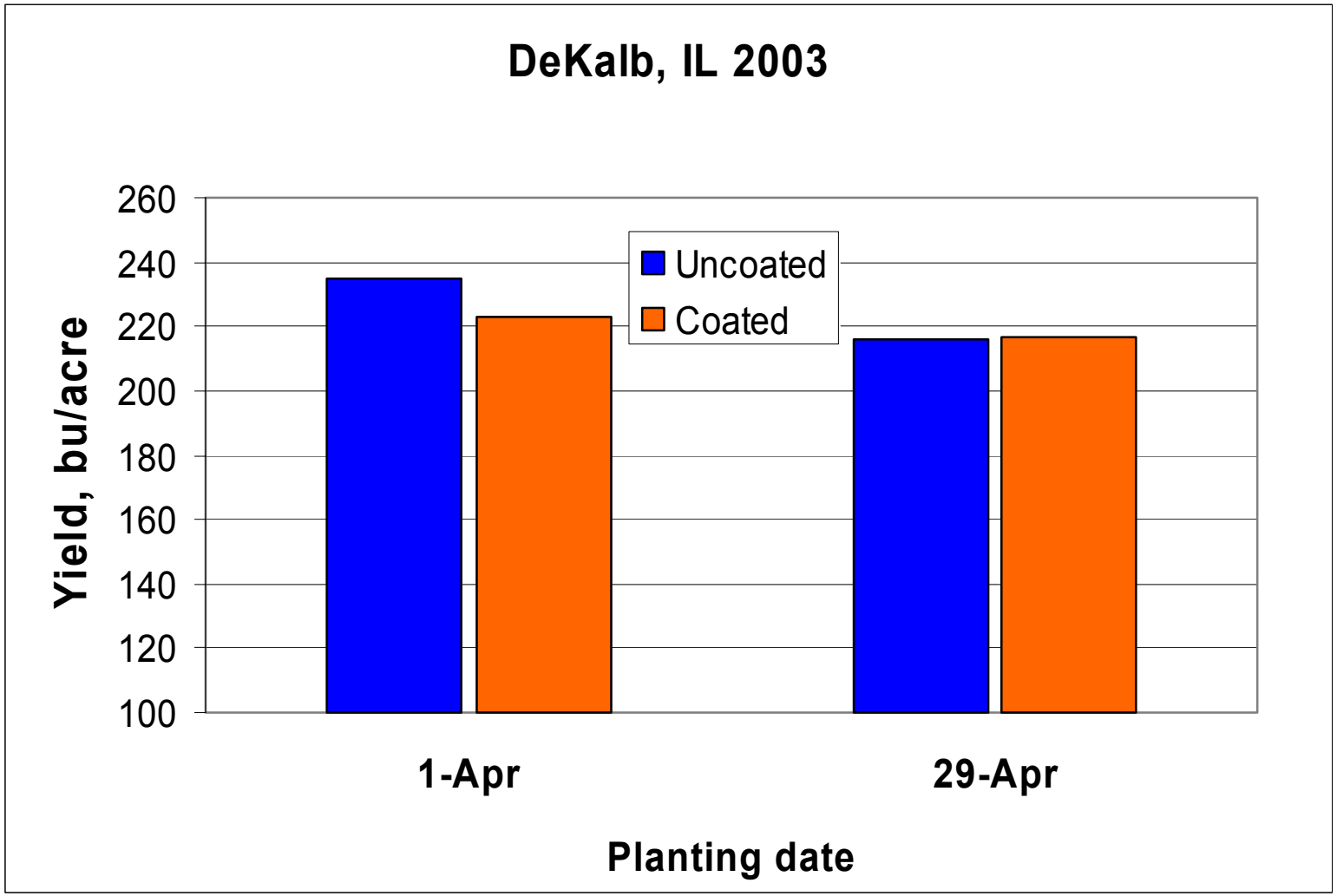
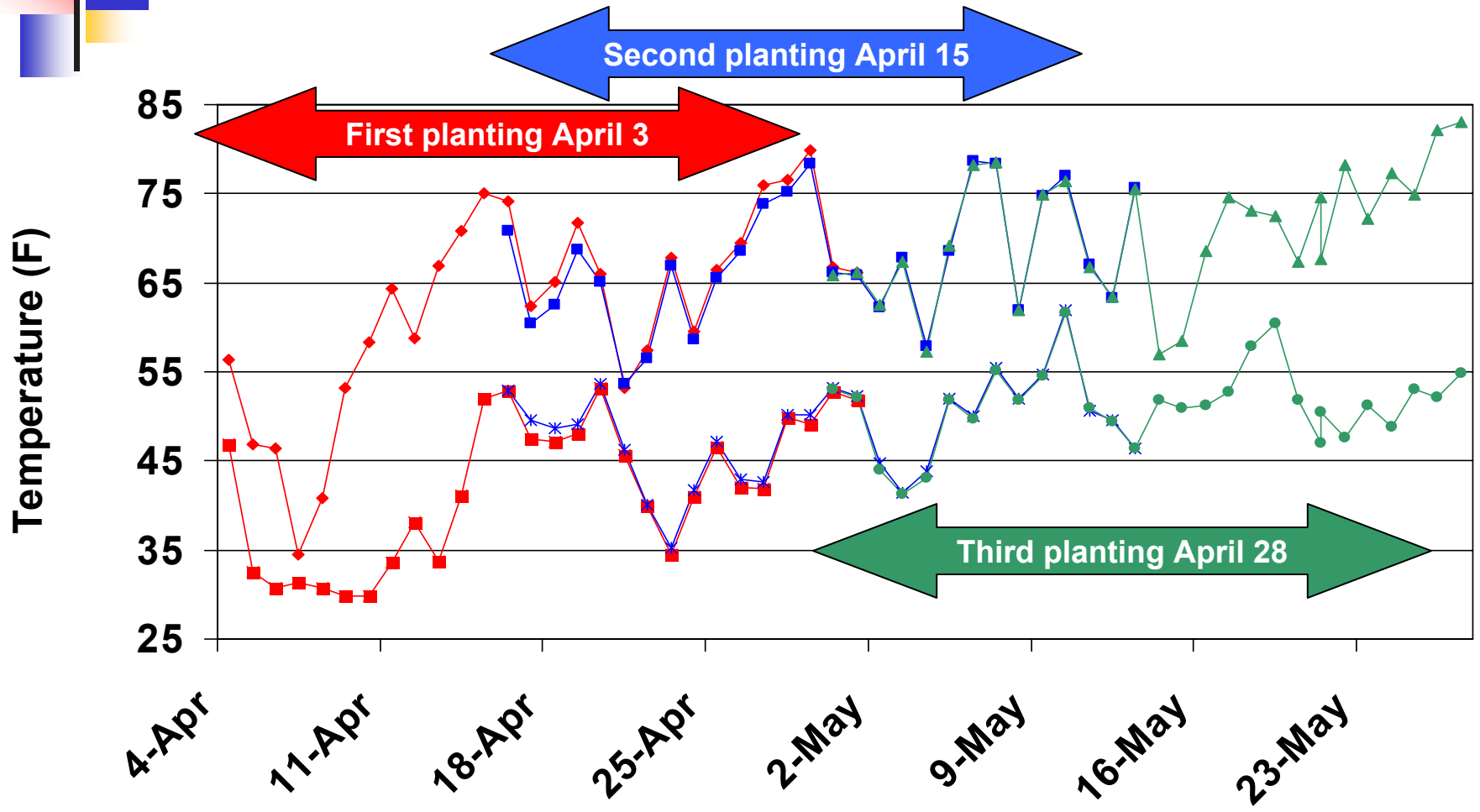


Source: Dr. E. Nafziger

Maximum and minimum soil temperatures after planting,

Polymer Corn Study, Wanatah, 2003



Polymer Coatings for Hybrid Corn

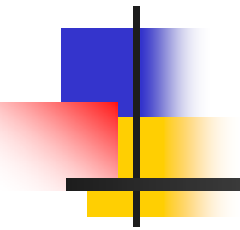
- Corn emergence a function of "trigger" soil temperatures; delays were often as small as 1 day, but could be as much as 5 days
- Higher corn populations resulted with very early planting plus inclement weather
- Considerable interaction with hybrids (emergence delay, population influence, yield effect, etc.)
- No corn yield benefit relative to planting during normal planting period.
- No negative yield effects when planting delayed

Recommendations

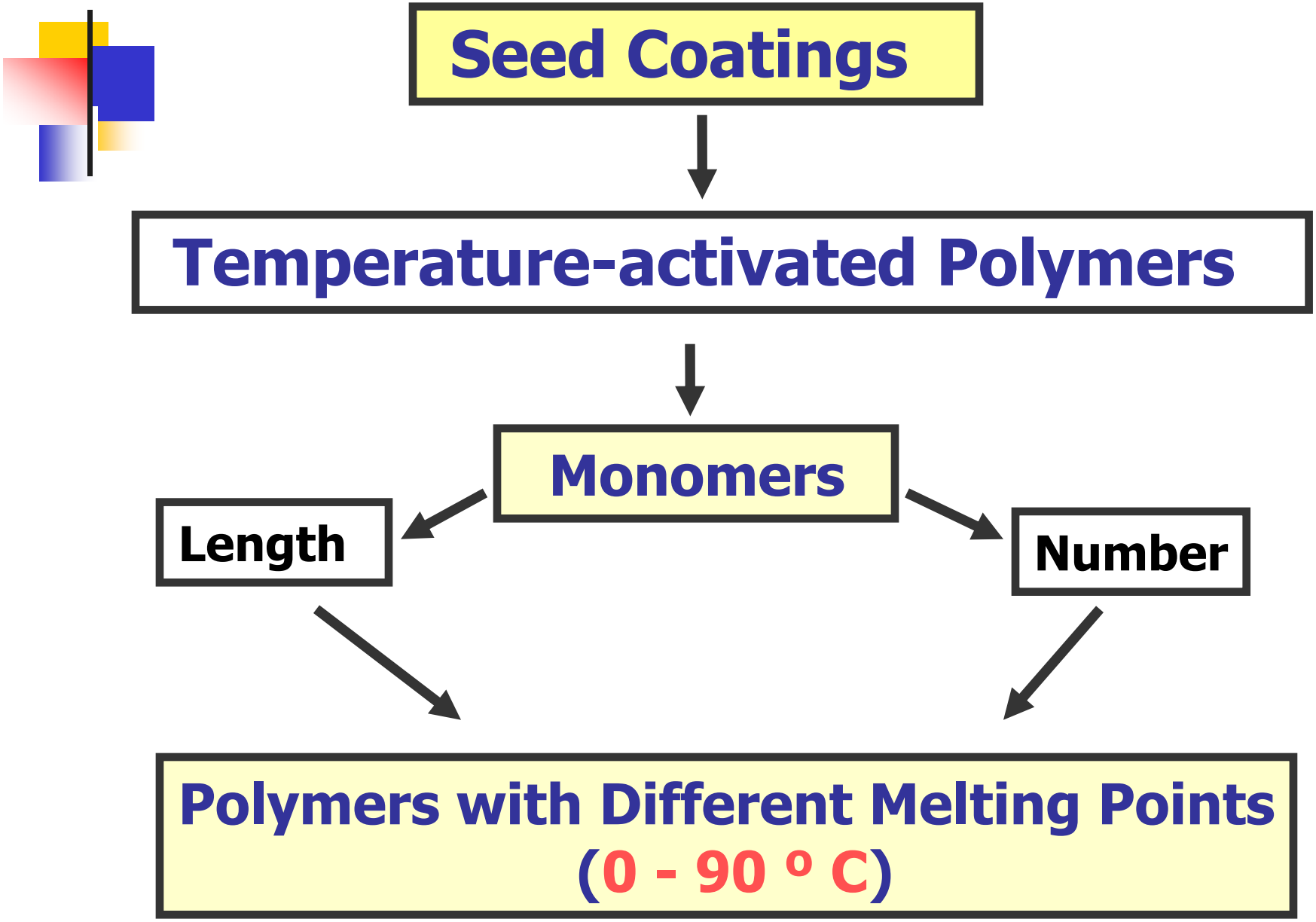
- **Needs to provide an economic advantage to become widely adopted. More research and on-farm evaluation required**
- **Employ coatings on corn hybrids with high seedling vigor and early cold tolerance**
- **Planter adjustment even more important (uniform seeding depth)**
- **Population determination for early plant?**

Acknowledgments

- Landec Ag (Monticello and Oxford, Indiana)
- Purdue Research Foundation
- Technical assistants and farm superintendents

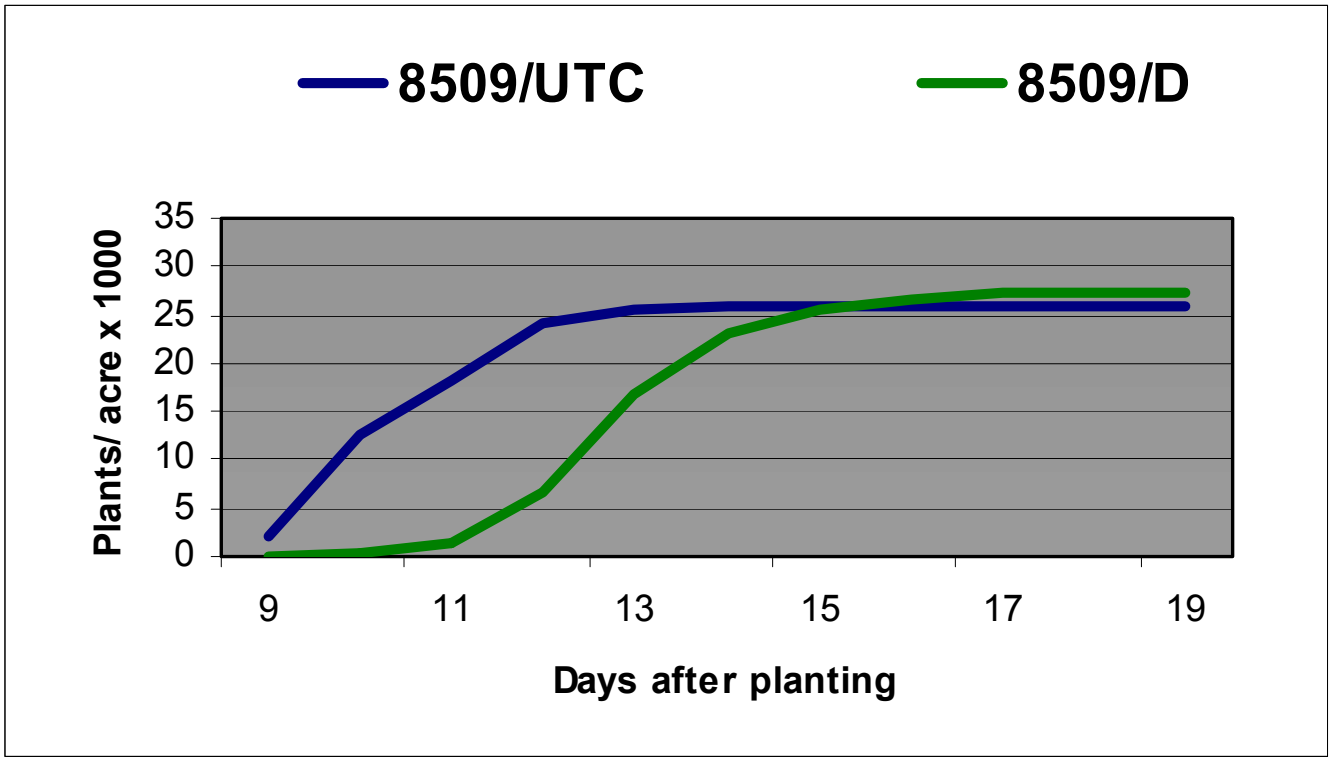


Q & A



Emergence Profile 2001

Planting Date: April 19



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Emergence Profile 2001

Planting Date: April 19