Effects of Genetically modified Corn Seed on Growers in Southwestern Nebraska

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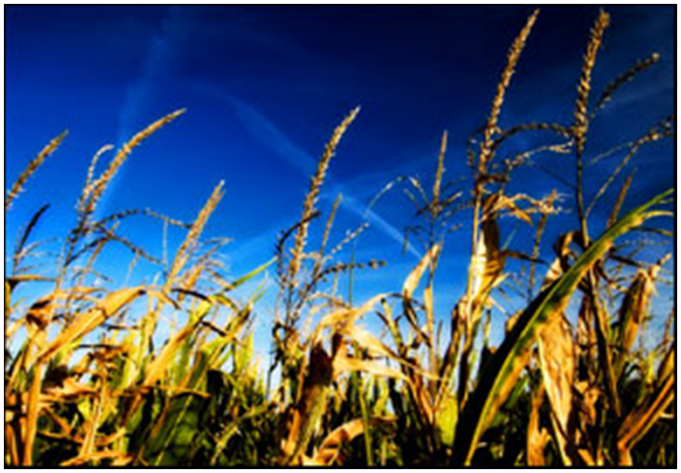
AGEC-4960



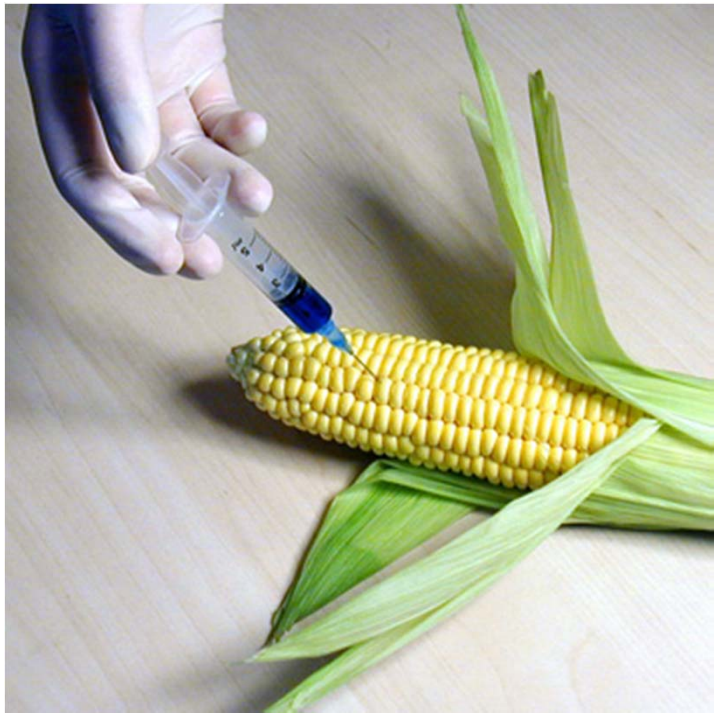
http://www.landreport.com/wp-content/uploads/2008/05/corn_ethanol.jpg

Outline

- Background
  - History
- Reason for Research
- Methods
  - Benefits
  - Costs
  - Risk
- Conclusion

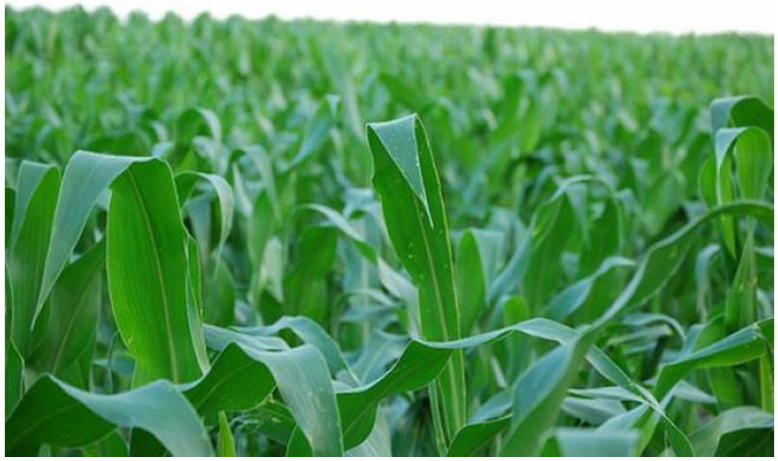
Background

- Incredible new technology
  - Round-up
  - Bt
  - Down the pipeline
    - Drought
    - Fungicide packages
    - Plant health
- Why are these neat and important to look at?



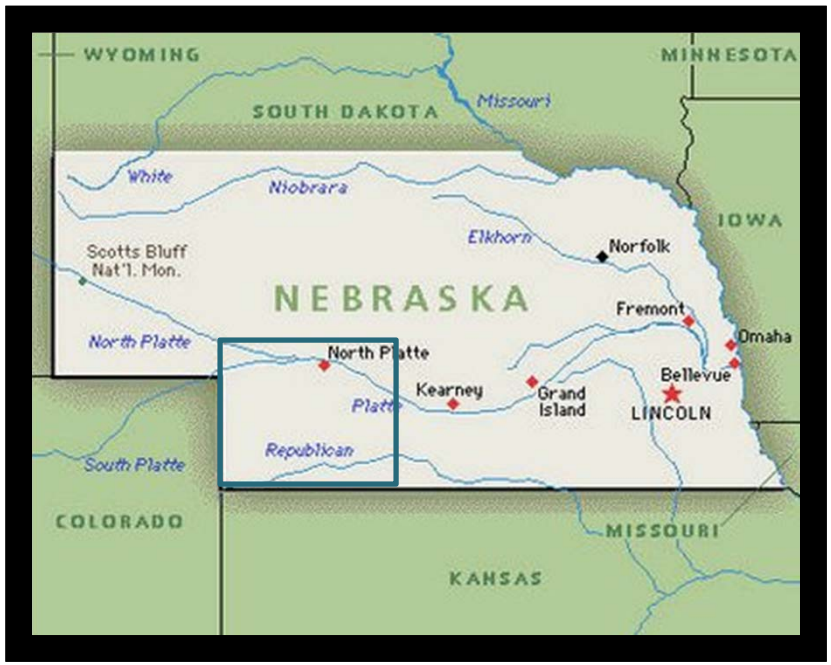
http://politicolnews.com/wp-content/uploads/2009/08/GMO-CORN.bmp

- GMO corn seed can effect decisions that producers have to make on
  - Chemicals
  - Applications
  - Moisture
  - Tillage



http://www.thetechherald.com/media/images/200915/2675568751_f8389be5b3.jpg

- I chose to use Southwest Nebraska as my research area
- Availability of input prices was easier
- Topics covered are directly relevant to the area.



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Technology

- VT Triple
  - Monsanto
  - Round-up Ready
  - Bt
    - Rootworm
    - Corn Borer
  - $280/bag will cover 2.6 acres at a planting population of 30,000

- Round-Up Ready
  - Herbicide Tolerance
  - No Bt
  - $220/bag

- Conventional
  - No Herbicide Tolerance
  - No Bt
  - $200/bag

VT Triple

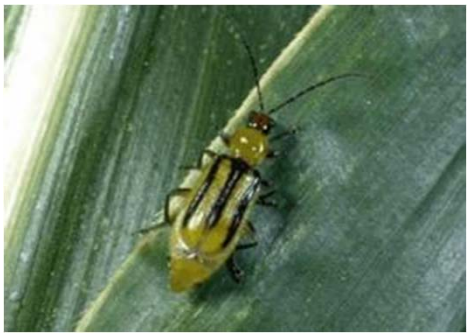
- One of the newer options on the market
- Triple means Triple stack, or 3 traits
- No applications for Rootworm and Corn borer
- Required 20% refuge acres by EPA
- 5% average yield boost over conventional

Round Up Ready seed

- Technology has been around since 1998
- Just Round-up Ready trait
- Applications for Rootworm and Corn borer required
- 5% average yield increase over conventional

Conventional

- No genetically modified genes
- Applications to control Rootworm and Corn borer
- Cannot apply Round-up to control weeds.



http://www.ca.uky.edu/entomology/entfacts/images/wcr.jpg

Methods

- Used a partial budget to examine costs included with each option
- Included yield comparisons, and considered market price of $3.18/bu. to find a value added from production.
- Included costs of seed, fertilizer, chemical, custom operations/applications, fuel/lube, repairs, and irrigation costs.
- Did not include labor, environmental effects, or time.

Assumptions

- Land and Center Pivots are owned
- Equipment is owned
- Has chemical application equipment, until it needs to be aerially applied.
- These are not necessarily the case everywhere but helps when looking at the raw costs of other inputs

GMO versus Conventional

Item	GMO	Conventional
Non-drought year / per acre	Dekalb VT3	No-GMO genes
Gross value of production		
Primary product: Corn	636.00	604.20
Total, gross value of production	636.00	604.20
Operating costs:		
Seed	107.70	77.00
Fertilizer	100.00	100.00
Chemicals: Pesticide/Fungicide/Herbicide	32.40	36.40
Custom operations/applications	6.50	13.00
Fuel, lube	10.98	20.00
Repairs	10.59	20.00
Irrigation costs 26 in/yr	38.08	38.08
Total, operating costs	306.25	304.48
Value of production less operating costs	329.75	299.72
Supporting information:		
Yield (bushels per planted acre) 5% increase	200	190
Price (dollars per bushel at harvest)	3.18	3.18
Enterprise size (planted acres)	136	136

- Assumed 5% yield increase
- Irrigated 7 inches with center pivot at $5.44/acre inch
- 10.02% increase in value of production

Profit

	Profits for 1000 ac. Farm	
	GMO per acre value	Conventional per acre value
Regular acres	329.75x800=$263,800	299.72x1000=$299,720
Refuge acres	299.72x200=$59,944	
	TOTAL	TOTAL
	$323,744	299,720

- Refuge acres have the same cost scheduling as the Conventional acres

GMO versus Round-up Ready

Item	GMO	Conventional
Non-drought year / per acre	Dekalb VT3	RR Seed
Gross value of production		
Primary product: Corn	636.00	636.00
Total, gross value of production	636.00	636.00
Operating costs:		
Seed	107.70	84.60
Fertilizer	100.00	100.00
Chemicals: Pesticide/Fungicide/Herbicide	32.40	56.40
Custom operations/applications	6.50	13.00
Fuel, lube	10.98	10.98
Repairs	10.59	10.59
Irrigation costs 26 in/yr	38.08	38.08
Total, operating costs	306.25	313.65
Value of production less operating costs	329.75	322.35
Supporting information:		
Yield (bushels per planted acre)	200	200
Price (dollars per bushel at harvest)	3.18	3.18
Enterprise size (planted acres) 1/	136	136

- Assumed no yield increase
- Irrigated 7 inches with center pivot at $5.44/acre inch
- 2.3% increase in value of production

Profit

- Refuge acres have the same cost schedule as the RR acres

	Profits for 1000 ac. farm	
	GMO per acre value	RR per acre
Regular acres	329.75x800=$263,800	322.35x1000=$322,350
Refuge acres	322.35x200=$64,470	
	TOTAL	TOTAL
	$328,270	$322,350

GMO versus Conventional, Risk of low rainfall year.

Item	GMO	Conventional
Drought year / per acre	VT3	No-GMO genes
Gross value of production		
Primary product: Corn	636.00	604.20
Total, gross value of production	636.00	604.20
Operating costs:		
Seed	107.70	77.00
Fertilizer	100.00	100.00
Chemicals: Pesticide/Fungicide/Herbicide	32.40	36.40
Custom operations/applications	6.50	13.00
Fuel, lube	10.98	20.00
Repairs	10.59	20.00
Irrigation costs 26 in/yr	59.84	59.84
Total, operating costs	328.01	326.24
Value of production less operating costs	307.99	277.96
Supporting information:		
Yield (bushels per planted acre)	200	190
Price (dollars per bushel at harvest)	3.18	3.18
Enterprise size (planted acres)	136	136

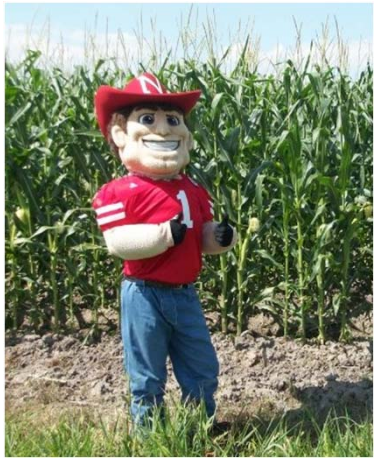
- Crop needs 26 inches to be fully irrigated
- Figured 11 inches put on by center pivot at $5.44/acre inch

	Profts for 100 ac. Farm in Drought year	
	1000 acre farm	
	GMO per acre value	Conventional per acre value
Regular acres	307.99x800=$246,392	277.96x1000=$271,460
Refuge acres	277.96x200=$55,592	
	TOTAL	TOTAL
	$301,984	$277,960

- Drought year profits
- $21,760 less profit for both due to irrigation costs compared to non-drought year

http://geology.com/usgs/images/center-pivot-irrigation-picture.jpg

Why use GMO's?



- Ease to producer
- Technology
- Yields
- Because Herbie says so

Why some people don't

- Some producers are stuck in their ways
- Familiarity with their current production
- Refuge acres required

Conclusions

- GMO's are the way of the future
- If you are a producer and not using GMO's, you are leaving profit in the field.
- The profit increase is there, which should drive most growers to use them.
- Demand by growers will continue to drive R&D

http://springermountainfarms.com/Merchant5/graphics/corn_web.jpg

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