PGRs Management in Short-Season Cotton

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Considerations for PGR Use

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- Bigger plants require higher rates for same effect – diluted by plant growth
- Not permanent – hormonal effect diluted over time and with good growing conditions; sequential applications common
- Can only impact future growth; applications should be based off growth potential not current plant height
- “Pix effect” – darker green plants post application
  - Inhibits cell expansion in stems AND leaves = thicker leaves = thicker layer of green cells = darker green

PGR Trial Overview – Texas High Plains

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- Two varieties – DP 1646 B2XF & FM 1830 GLT

- Drip irrigation (30” rows, tape every other row middle).
  - 16” rain + ~6” of irrigation

- Four PGR (mepiquat chloride) application schedules:
  - 1. nontreated
  - 2. 4 oz @ pinhead, EB, EB + 2 wk; 8 oz @ EB + 4 wk (20 oz total)
  - 3. 12 oz @ EB and EB + 4 wk (24 oz total)
  - 4. 24 oz @ EB + 4 wk (24 oz total)

Maturity	Height	NUCB	Total Nodes	% Open
Variety				
DP 1646 B2XF	34.1 a	11.4 b	22.5 a	42.1 b
FM 1830 GLT	26.3 b	12.6 a	20.7 b	62.3 a
Range	*7.8*	*1.2*	*1.8*	*20.2*
PGR Treatment (phsq, EB, EB+2 wk, EB+4 wk.				
None	33.2 a	11.7	22.6 a	47.3
1 (4, 4, 4, 8)	27.5 b	12.1	20.6 b	53.5
2 (0, 12, 0, 12)	27.8 b	12.3	21.0 b	54.5
3 (0, 0, 0, 24)	32.4 a	11.9	22.1 a	53.4
Range	*5.7*	*0.6*	*2*	*7.2*

PGR Trial Overview – OK Panhandle

- Treatments: Applications of generic mepiquat chloride applied at early squaring (SQ, pinhead – matchhead square), early bloom (EB), and mid bloom (MB).
  - Treatment 1 – Non-treated check (NTC) **(0 total ounces)**
  - Treatment 2 – 4 oz @ SQ, 8 oz @ EB, and 16 oz @ MB **(28 total ounces)**
  - Treatment 3 – 8 oz @ SQ, 16 oz @ EB, and 24 oz @ MB **(48 total ounces)**
  - Treatment 4 – 0 oz @ SQ, 16 oz @ EB, and 16 oz @ MB **(32 total ounces)**

- In-season measurements taken 9/4/2019, approximately 2 weeks after MB application.

Variety	Height (in)	Total Nodes	H:N	NAWF
PHY 210 W3FE	23.3 c	17.9 ab	1.31 c	2.71
PHY 250 W3FE	23.8 c	17.6 b	1.37 c	2.76
PHY 320 W3FE	27.5 a	18.5 a	1.50 ab	2.94
PHY 350 W3FE	27.8 a	18.4 a	1.52 a	2.78
PHY 400 W3FE	25.7 b	18.0 ab	1.43 b	2.94
PX2C14	26.4 b	18.4 a	1.44 b	2.94
Range	*4.5*	*0.9*	*0.21*	*0.23*

Treatment (MHSQ, EB, MB)	Height (in)	Total Nodes	H:N	NAWF
1 (NTC)	25.8 b	18.0	1.44 ab	2.88
2 (4, 8, 16)	25.3 b	18.1	1.40 b	2.83
3 (8, 16, 24)	25.3 b	18.0	1.41 b	2.81
4 (0, 16, 16)	26.7 a	18.4	1.46 a	2.86
Range	*1.4*	*0.4*	*0.06*	*0.07*

Other Factors that Regulate Growth

- Variety selection – range of maturity classes in cotton will also differ in growth habits/potential
- Fruit retention – cotton is indeterminate but supplying developing flower buds and fruit is priority
- Proper management of nutrients and water – avoid stress and excesses when possible
- All of these are more effective (and cheaper) than applying PGRs. PGR products are very good at inhibiting growth in periods of extremes or excess; maturity managed through variety selection and timeliness of inputs

PGRs in Dryland Cotton

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- Unnecessary in some areas, may depend on harvest method, but can be more tricky in short season environments compared to irrigated
- Rainfall and potential need for PGRs increases as we move west to east in KS and OK, favor mid-late maturing varieties more prone to excessive growth
- Water and/or heat stress result in fruit shed that could result in rank growth
- Early season storm damage (wind or hail) cause fruit loss or split terminal
- Too much plant for remaining fruiting sites, will put resources towards vegetative growth.
- Favorable season-long conditions constantly fueling growth

PGRs in Dryland Cotton

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- Risk of applying – applications in the absence of excess moisture may result in premature cutout, lost yield potential, favor regrowth late
  - Particularly early applications of consecutive high rates
- Risk of not applying – heavy rains may spur rank growth, delay harvest aid effectiveness (poor coverage), interfere with harvest operations and efficiency
  - Miss prime application window, difficult to catch up due to plant size
- Anticipate need by mid-late squaring of PGRs based on plant size, yield potential, variety characteristics, field history, and forecast.
- If you can justify application, allows for lower rate to go early and possibly combined with layby or insecticide application.

Impact of Harvest Method on PGR Needs

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- Shorter & compact plants more desirable for stripper harvest
- Beneficial for harvest aids and increases harvest speed and efficiency
- Conducive environmental conditions in stripper harvester regions
- Variety selection and management taking plant stature into account
- Personal preference

Thank You

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