| | | | |
|---|---|---|---|
| **Project** | **DEFOLIATION TRIAL** | **Project leader** | **COTTON SA: CALVIN KNIGHT/ANNETTE BENNETT** |
| **Locality** | Schweizer-Reneke | **Co-worker:** | **Jozeph du Plessis** |
| **Varieties** | DP 1240 (80 000 seeds\ha) | | |
| **Layout:** | Strip trial design with 2 statistical repetitions | Dryland trial | |
| **Plant date:** | 2021/11/02 | | |
| **Plot size:** | Length of rows: 1450m (48 rows @ 1.14m = 7.9ha) | | |
| **Sprayed: according to lable recommendations** | | | |
| **Cultivar:** | DP 1240 (80 000 seeds\ha) | | |

**No. of samples per treatment: Baseline (n = 6) others n = 4 x 2 technical repetitions**

| No. of seedcotton samples taken | | | Dates of seed cotton sampling |
|---|---|---|---|
| **1st samples** | **Baseline** | before any spraying | 19/5/2022 |
| | | Spraying | 23/05/2022 (week of) |
| **2nd samples** | **Control** | | 7/6/2022 |
| | **Ethapon** | | 7/6/2022 |
| | **Ginstop** | | 7/6/2022 |
| | **Ethapon + Ginstop** | | 7/6/2022 |
| **3rd samples** | **All treatments (the day after harvesting)** | | 22/07/2022 |

| Seed cotton yields | ton/ha |
|---|---|
| Control | 1,21 |
| Ethephon | 1,43 |
| Ginstop | 1,32 |
| Ginstop & Ethephon | 1,45 |

**Yield results:**

*Yields corresponded with what was seen in the field visually

*Control had fewer open bolls and also the lowest yield.

*Ethaphon alone or with Ginstop gave marginally better yields - -probably forcing bolls to open. Ethaphon treatments had more open bolls - confirming the significance of using Ethaphon

| | | | | | | |
|---|---|---|---|---|---|---|
| **1st sampling results:** | **Baseline** | 1.224 (1" 7/32") | 84,48 | 31,64 | 3,82 | 158 |

**2nd sampling results:** **Post Spray Fibre quality averages for each treatment**

| Treatment | UHML (Inches) | Uniformity (%) | Strength (g/Tex) | Micronaire | SCI |
|---|---|---|---|---|---|
| **Control** | 1.183 (1" 3/16) | 83,48 | 28,19 | 3,78 | 143 |
| **Ethaphon** | 1.183 (1" 3/16) | 83,65 | 28,05 | 3,83 | 143 |
| **Ginstop** | 1.165 (1" 5/32") | 82,70 | 26,88 | 3,49 | 137 |
| **Ginstop & Ethaphon** | 1.174 (1" 5/32") | 82,73 | 27,65 | 3,53 | 139 |
| **Std Dev** | 0,027 | 0,896 | 1,733 | 0,274 | 8,993 |

**3rd sampling results:** **Post Spray & post harvest fibre quality averages for each treatment**

| Treatment | UHML (Inches) | Uniformity (%) | Strength (g/Tex) | Micronaire | SCI |
|---|---|---|---|---|---|
| **Control** | 1,127 | 79,99 | 25,40 | 2,82 | 113 |
| **Ethaphon** | 1,143 | 80,13 | 26,25 | 2,84 | 119 |
| **Ginstop** | 1,122 | 79,77 | 25,08 | 2,83 | 111 |
| **Ginstop & Ethaphon** | 1,133 | 79,68 | 26,00 | 2,71 | 116 |
| **Std Dev** | 0,028 | 1,351 | 1,495 | 0,243 | 10,249 |

| Significant differences (groupings) |
|---|
| a |
| ab |
| b |
| bc |
| c |

**Results:**

*Fibre lengths of all the treatments were significantly shorter than that of the baseline, which was sampled much earlier. Adequate seasonal length is important to ensure crop maturity

*Uniformity decreased over time, with the baseline having a significant higher uniformity; but all values were acceptable; unripe fibre when mature and immature bolls are mixed as season goes on.

* Fibre strength decreased over time, with the baseline samples showing a more acceptable strenght. Ginstop showed the lowest fibre strength.

The reason for this is unknown.

* Significantly lower micronaire was seen in the Ginstop treatments.

* SCI was acceptable, but also lower in the Ginstop treatments, the SCI values are influenced by the low micronaire and strength values

* The effect of timing of harvesting after chemical treatment on fibre quality and associated income for a specific lint class, possibly needs to be investigated.

* A lower micronaire (< 3,5) can place the crop in a lower class. All treatments showed lower micronaire and strength as the season progressed.

**Project** **DEFOLIATION TRIAL**

**Input costs for defoliation**

| Treatments | | Cost/ha |
|---|---|---|
| Control | R | - |
| Ginstop | R | 404,94 |
| Ethepon | R | 315,33 |
| Ginstop & Ethepo | R | 637,84 |

*cost were about 15% higher according to farmer

**GRADING**

**SEEDCOTTON GRADE:** Grade D, similar in all treatments

**LINT GRADE:** SLM/LM - similar in all treatments

**Percentages Boll burst**

| Dates of sampling | 19/05/2022 | 07/06/2022 | 07/06/2022 | 07/06/2022 | 07/06/2022 | |
|---|---|---|---|---|---|---|
| | Baseline | Control | Ethaphon | Ginstop | Ginstop & Ethaphon | |
| Sample 1 | 32% | 78% | 74% | 86% | 93% | |
| 2 | 42% | 84% | 89% | 85% | 83% | |
| 3 | 42% | 80% | 87% | 72% | 84% | |
| 4 | 67% | 72% | 81% | 84% | 94% | |
| 5 | 47% | | | | | |
| 6 | 53% | | | | | Stdev |
| | 47% | 79% | 83% | 82% | 88% | 6% |

**Highest node**

| 19/05/2022 | 07/06/2022 | 07/06/2022 | 07/06/2022 | 07/06/2022 |
|---|---|---|---|---|
| **Baseline** | **Control** | **Ethaphon** | **Ginstop** | **Ginstop & Ethaphon** |
| 12 | 19 | 17 | 19 | 18 |
| 8 | 19 | 18 | 16 | 16 |
| 11 | 19 | 18 | 19 | 18 |
| 7 | 14 | 14 | 13 | 16 |
| **10** | **18** | **17** | **17** | **17** |

**Bollburst results:**

* The number of open bolls on the control was lower than on any of the Ethaphon or Ginstop/combination treatments
*More bolls were open in the Ethaphon treatment than the Ginstop only treatmnet.
*The highest number of open bolls were found in the Ginstop& Ethapohon combination treatment.

**No. of node results:**

*Nodes were counted earlier in May for the baseline samples. Nodes increased in all the treatments as expected.
*More nodes were found in the control treatment, but the number did not differ much from the chemical treatments.

Final conclusion:

* Defoliation force leaf drop. Thus photosynthesis stop, which influence micronaire.
Other treatments had time to form cellulose, thus micronaire
* Approx. 8 weeks have passed following defoliation before harvesting - this causes unripe fibre and subsequent a low micronaire in the Ginstop treatments.
However over a longer time period all qualities dropped significantly
* The cost of performing combined spraying must be weighed up against the loss of income due to loss in quality, but the gain in yield.
* Important message is that time of harvesting after defoliation can influence quality

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