GENERAL INFORMATION

Trial code 17_10T EXAL_4_BFEPNL00_00GR_17
Collaboration ANADIAG HELLAS
Location Greece
Trial area Thessaly
Start date 01/06/2017
End date 21/09/2017
Developed by ANADIAG HELLAS Technical Team

OBJECTIVES

The objectives of this trial through the application of the different Stoller treatments are:

- Increase boll set, avoiding their abscission due to stress.
- Increase the fiber content of the boll and their quality.
- Improve crop production.

TRIAL DESCRIPTION

Crop Cotton (Gossypium hirsutum)
Variety Delta pine 419
Planting date 12/04/2017
Trial design 1 Control and 3 treatments.
Fertilization Grower’s fertilization plan.

INTRODUCTION

Cotton, (Gossypium hirsutum), is a crop of high global importance, as a source of raw material for the textile industry. In Europe, Spain and Greece are the main producing countries, the latter being the country responsible for 85% of the production with more than 230,000 tons per year. In the case of Spain, the annual production is estimated at more than 40,000 tons.

The low yield per cultivated area and the crop’s susceptibility to biotic and abiotic stress, creates the need to propose strategies in order to increase the yield.

To this end, it is proposed in the present trial, which includes 4 theses: a Control thesis, treated with the usual treatments of the area and 3 theses based on the development of different strategies with Stoller Technology, applied at specific phenological moments, with the aim of influencing key physiological processes, to achieve the proposed objectives.
## PRODUCT CHARACTERISTICS

### BIOFORGE

The Stoller Technology contained in the product, regulates ethylene levels in the plant, derived from stress situations. Applied at the beginning of the cotton crop, the product is able to combat the effect of stress caused by adverse weather conditions, thus ensuring a good crop establishment.

### PLUS STIMULANTE

The Stoller Technology contained in the product, promotes the hormonal balance between the three growth hormones, Auxins, Cytokinins and Gibberellins, thus improving flowering, avoiding abortion of the bolls and increasing the quantity and quality of the fibers.

### N-BALANCER

It is a source of highly assimilable boron and molybdenum. Boron is essential to: avoid boll abscission; promote the correct boll development and filling and, indirectly, control the apical dominance during the vegetative development. Molybdenum on the other hand will play an important role in the metabolism of nitrogen in the plant.

## PRODUCTS AND TREATMENT DOSES

<table>
<thead>
<tr>
<th>No.</th>
<th>Treatments</th>
<th>Dose</th>
<th>Application Method</th>
<th>Application Moment*</th>
</tr>
</thead>
<tbody>
<tr>
<td>T0</td>
<td>CONTROL MEPIQUAT PIRAFLUFEN ETIL ETHEPHON</td>
<td>1 L/ha (C); 0.5 L/ha (D) 100 ml/ha (E) 2.5 L/ha (E)</td>
<td>FOLIAR</td>
<td>A: BBCH (16 – 17) 5 – 9 True Leaves  B: BBCH (51 – 52) Flower Buds Visible  C: BBCH (59 – 61) Beginning of Flowering</td>
</tr>
<tr>
<td></td>
<td>T1</td>
<td>BIOFORGE MEPIQUAT PIRAFLUFEN ETIL ETHEPHON</td>
<td>1 L/ha (A) 1 L/ha (C); 0.5 L/ha (D) 100 ml/ha (E) 2.5 L/ha (E)</td>
<td>FOLIAR</td>
</tr>
<tr>
<td></td>
<td>T2</td>
<td>BIOFORGE STIMULANTE PLUS MEPIQUAT PIRAFLUFEN ETIL ETHEPHON</td>
<td>1 L/ha (A) 1 L/ha (C) 1 L/ha (C); 0.5 L/ha (D) 100 ml/ha (E) 2.5 L/ha (E)</td>
<td>FOLIAR</td>
</tr>
<tr>
<td></td>
<td>T3</td>
<td>BIOFORGE STIMULANTE PLUS N-BALANCER</td>
<td>1 L/ha (A) 0.5 L/ha (B+C) 3 L/ha (B+C+E)</td>
<td>FOLIAR</td>
</tr>
</tbody>
</table>

The Treated and Control theses, received the same nutritional and phytosanitary treatments.

* Mixture Volume: 500 L/ha.

---

**Figure 1.** Cotton crop cycle.
WEATHER CONDITIONS DURING THE DEVELOPMENT OF THE TRIAL

<table>
<thead>
<tr>
<th>Date</th>
<th>Phenological Stage</th>
<th>Moment</th>
<th>Wind Vel (m/s)</th>
<th>Temperature (ºc)</th>
<th>Humidity(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>01/06/2017</td>
<td>BBCH (17 – 18)</td>
<td>A 5 – 9 True Leaves</td>
<td>0</td>
<td>24.4</td>
<td>45.8</td>
</tr>
<tr>
<td>29/06/2017</td>
<td>BBCH (51 – 52)</td>
<td>B Flower Buds Visible</td>
<td>0</td>
<td>31.6</td>
<td>54.3</td>
</tr>
<tr>
<td>10/07/2017</td>
<td>BBCH (60 – 61)</td>
<td>C Beginning of Flowering</td>
<td>0</td>
<td>27.5</td>
<td>58.3</td>
</tr>
<tr>
<td>02/08/2017</td>
<td>BBCH (61 – 65)</td>
<td>D Full Flowering</td>
<td>0</td>
<td>29.1</td>
<td>42.9</td>
</tr>
<tr>
<td>07/09/2017</td>
<td>BBCH (82 – 84)</td>
<td>E 30% Open Bolls</td>
<td>0</td>
<td>25.8</td>
<td>67.2</td>
</tr>
</tbody>
</table>

EVALUATION

In order to analyze the effect of the products on the crop, the productive yield of the crop (Kg/Ha) is quantified for each of the theses.

HARVEST PRODUCTION (Kg/Ha)

As observed in the data contained in TABLE I represented in GRAPH 1, the thesis treated with Stoller Technology or in combination of said technology with conventional treatments (T1, T2 and T3), improve the results obtained by the Control thesis (T0) treated with the conventional treatments, showing increments ranging between 4.9 and 5.5%.
CONCLUSIONS

**STIMULANTE PLUS:** The Stoller Technology contained in the product, has stimulated the synthesis of the three growth hormones (Auxins, Cytokinins and Gibberellins), inducing the necessary hormonal balance to optimize the development of the plant, improving the boll set and the production.

**BIOFORGE:** The Stoller Technology contained in the product, has been able to regulate the levels of the stress hormone, ethylene, during the start of the crop. This way, the stress produced by adverse weather conditions was minimized, thus avoiding boll abscission, which has resulted in an increase in production.

**N-BALANCER:** The Stoller Technology contained in the product, has stimulated the transfer of sugars from the leaves in the bolls, regulating thus the vegetative development and improving boll development, set and filling.

Under the conditions in which the present trial was developed, it can be concluded that the Stoller Technology contained in the products **STIMULANTE PLUS, BIOFORGE and N-BALANCER:**

- **INCREASES BOLL SET:** All the theses treated with Stoller Technology, have helped the crop minimize the effect of stress produced by the adverse weather conditions that occurred in Thessaly during the development of the trial, enabling boll set and their subsequent filling.

- **INCREASES PRODUCTION (Kg/Ha):** All the theses treated with Stoller Technology, showed an increase in production in comparison the Control thesis, having increments between 4.9 and 5.5%.

**TRIAL PREPARED BY:**
ANADIAG HELLAS
Technical Center specialized in GEP trials in Greece.

VICENTE DOMÉNECH and ABBAS CABALLERO
Stoller Europe Technical Department.