INTRODUCTION

Cotton is one of the most ancient and important commercial crop next to food grain. India ranks third in production of cotton lint but the productivity of lint cotton is the only 294 kg ha\(^{-1}\) (Anonymous, 2000). Among the various constraints of low productivity erratic behavior of rainfall, lack of improved technology, lack of organic manuring, unavailability of timely irrigation, lack of use of plant protection measures etc. The demand for clothing is also increasing and to fulfill this demand special attention needs to be given to increase the productivity of cotton crop which could be achieved only by using best quality seed, timely and sufficient quantity of irrigation, balance nutrient management, weed control followed by plant protection measures. Besides these techniques, use of plant growth regulators also needs to be adopted.

Plant growth regulators are organic compounds other than nutrients, which increases yield and improves quality through stimulation of plant metabolism resulting in better mineral uptake, assimilates flow and quicker synthesis of enzymes, membrane stress protectors, and other indispensable substances. It induces better root system and an improvement of cell membrane integrity and nutritional status renders plants less susceptible to the environmental pressure, reducing application of pesticide (Akram et al., 2003). The application of plant growth regulators in cotton are in vogue. But the plant growth regulators viz., Atonik and NAA were not tested in cotton crop to assign their effect on yield. Hence, these regulators were tested in cotton crop.

MATERIALS AND METHODS

An investigation was carried out during Kharif season of 2003 at Cropping Systems Research Project, Mahatma Phule Krishi Vidyapeeth, Rahuri on medium black soil. The soil was slightly alkaline in reaction, low in available nitrogen (140.15 kg ha\(^{-1}\)), medium in phosphorus (15.10 kg ha\(^{-1}\)) and high in available potash (415.90 kg ha\(^{-1}\)).

Eight treatment comparing of plant growth regulators, water spray along with control i.e. T\(_1\) - Seed treatment of Atonik 0.3% @ 3 ppm, T\(_2\) - Foliar Spray of Atonik 0.3% @ 0.1%, T\(_3\) - Foliar Spray of Atonik 0.3% @ 0.1%, T\(_4\) - Foliar Spray of Atonik 0.3% @ 0.1%, T\(_5\) - Foliar Spray of Atonik 0.3% @ 0.1%, T\(_6\) - Foliar Spray of Atonik 0.3% @ 0.1%, T\(_7\) - Foliar Spray of Atonik 0.3% @ 0.1%, T\(_8\) - Foliar Spray of Atonik 0.3% @ 0.1%.
@ 0.25 %, T₄ - Foliar Spray of Atonik 0.3 % @ 0.5%, T₅ - Foliar Spray of NAA @ 20 ppm, T₆ - Foliar Spray of NAA @ 40 ppm, T₇ - Foliar Spray of water, T₈ - Untreated control were tested in randomized block design by replicating thrice. The gross and net plot size were 8m x 6m and 6m x 4m, respectively. The crop was sown on 21st June 2003 by dibbling at spacing of 1mx1m. The spraying was done at tiny square formation stage (35DAS), first bloom stage (50 DAS), boll setting stage (85 DAS) by using hand compressor sprayer. The two control water spray and untreated control were used.

**RESULTS AND DISCUSSION**

The data recorded during the course of investigation were tabulated, statistically analysed and results are interpreted here under appropriate heads:

**Yield contributing characters:**

**Boll characters:**

Significant by the highest boll weight 3.99 g, seed cotton weight 3.54 g / boll, seed weight 2.26 g / boll, lint weight 1.28 g / boll was recorded in the treatment T₅ - Foliar spray of NAA @ 20 ppm being at par with T₆ - FS of NAA @ 40 ppm and T₇ - FS of Atonik 0.3 % @ 0.25 %. Similar results are also reported by Prasad and Prasad (1994) from their investigation.

**Seed cotton yield:**

All the treatments proved their significant superiority over control. Treatment T₅ - FS of NAA @ 20 ppm recorded significantly higher seed cotton yield (19.80 q ha⁻¹) followed by the treatment T₆ - FS of NAA @ 40 ppm (19.26 q ha⁻¹) and T₇ - FS of Atonik 0.3 % @ 0.25 %. The results are in close conformity with the results of Guo and Oosterhuis 1995 as they reported that the growth regulator Atonik has been found beneficial in improving yield. Patel (1992) and Pol and Thombre (1985) also confirmed the effect of application of foliar spray of NAA in increasing yield of seed cotton.

**Cotton stalk yield:**

All the treatment tested during the investigation found significantly superior over control. Treatment T₅ - FS of NAA @ 20 ppm recorded significantly higher cotton stalk yield (35.99 q ha⁻¹) being at par with the treatment T₆ - FS of NAA @ 40 ppm (35.28 q ha⁻¹). Similar findings are also reported by Choudhari and Batkal (1977) from the results of their investigation.

**Quality parameters:**

The study on quality parameters indicates that all the treatment were significantly superior over control. The treatment T₅ - FS of NAA @ 20 ppm was found significantly higher in ginning percentage (36.28 %), lint Index (3.92%), staple length (30.74 mm), bundle Strength (47.80 g tex⁻¹), maturity coefficient (0.92 %) and fibre fineness (4.35 milimex) over all the treatments except the treatment T₁ to T₄ were being at par with lint index( T₁ - 3.70,T₂-3.77, T₃-3.79, T₄-3.72 %). The treatment T₅,T₆ and T₇ were being at par among each other for staple length(T₁-30.60,T₂-30.64, T₃-30.62 mm). The seed -index was maximum in the control plot (6.88g) where as it was minimum lowest in the treatment T₅ - FS of NAA @ 20 ppm (6.49 g). The increase in quality parameter of cotton with the use of growth regulator Atonik was found beneficial as reported by Djanaguiraman et al., (2004).

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Treatments details</th>
<th>Boll weight (g)</th>
<th>Seed cotton weight boll¹ (g)</th>
<th>Seed weight boll¹ (g)</th>
<th>Lint weight boll¹ (g)</th>
<th>Seed cotton yield (q ha⁻¹)</th>
<th>Stalk yield (q ha⁻¹)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>T₁: ST of Atonik 0.3 % @ 3 ppm</td>
<td>3.50</td>
<td>3.18</td>
<td>2.04</td>
<td>1.14</td>
<td>17.12</td>
<td>32.36</td>
</tr>
<tr>
<td>2.</td>
<td>T₂: FS of Atonik 0.3 % @ 0.1%</td>
<td>3.64</td>
<td>3.24</td>
<td>2.07</td>
<td>1.17</td>
<td>17.92</td>
<td>33.62</td>
</tr>
<tr>
<td>3.</td>
<td>T₃: FS of Atonik 0.3 % @ 0.25%</td>
<td>3.79</td>
<td>3.37</td>
<td>2.15</td>
<td>1.22</td>
<td>18.86</td>
<td>34.44</td>
</tr>
<tr>
<td>4.</td>
<td>T₄: FS of Atonik 0.3 % @ 0.5%</td>
<td>3.68</td>
<td>3.20</td>
<td>2.05</td>
<td>1.15</td>
<td>17.46</td>
<td>33.13</td>
</tr>
<tr>
<td>5.</td>
<td>T₅: FS of NAA @ 20 ppm</td>
<td>3.99</td>
<td>3.54</td>
<td>2.26</td>
<td>1.28</td>
<td>19.80</td>
<td>35.99</td>
</tr>
<tr>
<td>6.</td>
<td>T₆: FS of NAA @ 40 ppm</td>
<td>3.86</td>
<td>3.46</td>
<td>2.21</td>
<td>1.25</td>
<td>19.26</td>
<td>35.28</td>
</tr>
<tr>
<td>7.</td>
<td>T₇: FS of water</td>
<td>3.52</td>
<td>3.10</td>
<td>1.99</td>
<td>1.11</td>
<td>16.59</td>
<td>31.64</td>
</tr>
<tr>
<td>8.</td>
<td>T₈: Untreated control</td>
<td>3.46</td>
<td>3.06</td>
<td>1.96</td>
<td>1.10</td>
<td>16.29</td>
<td>30.79</td>
</tr>
<tr>
<td>S.E.</td>
<td>0.08</td>
<td>0.09</td>
<td>0.06</td>
<td>0.04</td>
<td>0.04</td>
<td>0.04</td>
<td></td>
</tr>
<tr>
<td>C.D. (P=0.05)</td>
<td>0.24</td>
<td>0.27</td>
<td>0.18</td>
<td>0.12</td>
<td>0.12</td>
<td>0.12</td>
<td></td>
</tr>
<tr>
<td>General mean</td>
<td>3.69</td>
<td>3.27</td>
<td>2.09</td>
<td>1.18</td>
<td>17.91</td>
<td>33.41</td>
<td></td>
</tr>
</tbody>
</table>

ST: Seed Treatment      FS: Foliar Spray

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HIND AGRICULTURAL RESEARCH AND TRAINING INSTITUTE
From the results of the present experimentation, it can be concluded that for maximization of higher seed cotton yield, better quality of cotton fibre, foliar Spray of NAA as growth regulator @ 20 ppm at tiny square formation stage (first bloom stage and boll setting stage) should be adopted under irrigated cotton crop in deep black soils of scarcity zone of western Maharashtra.

Authors’ affiliations:
S.S. PAGAR AND S.S. CHITODKAR, Department of Agronomy, College of Agriculture, DHULE (M.S.) INDIA

**LITERATURE CITED**


