Guava (Psidium guajava L.) is one of the most important and extensively cultivated fruit crop of India. It is a good source of vitamin-C and pectin and widely used for making of jelly. The three times flowering seasons have been observed in North Indian conditions while two flowering seasons have been reported in the climatic condition of Assam regulators in the ovary, the ovary enlarge and fruit development is initiated. However, good fruit set is prevented by adverse weather which hinders pollen production, pollination and fertilization and also low level of auxin. The auxin from the pollen grain and pollen tube might be responsible for the early stage of fruit growth. However, small amount of pollen grains necessary to pollinate a flower may not carry enough auxin to account for early fruit development. The growing pollen tube may secrete auxin which helps in fruit growth (Muir, 1942).

The percentage of flowering and fruiting, poor fruit retention, poor yield and quality fruits are of major concern of the fruit growers. So, the present investigation was undertaken to find out response of plant growth regulators on flowering, fruit growth and quality of guava.

RESEARCH METHODS

The study was conducted in the orchard of Assam Agricultural University, Jorhat during 2009. Six years old plants of uniform size and vigour planted at 6 x 6 m. were selected for the study. Experiment was laid out under Randomized Block Design with three replications and 11 treatments, to know the effect of plant growth regulators on flowering and yield of guava. The maximum number of flowers (16) per shoot, highest fruit set per cent (93.13) and maximum numbers of fruit per shoot at harvest (6.2) were found with 1000 ppm CCC. The maximum fruit length (9.8 cm), fruit girth (10.23 cm), fruit weight (182g) and volume (178.3 cc), minimum fruit drop (38.8%) and yield (37.1 kg/plant) were recorded under 50 ppm GA3.

KEY WORDS : Guava, PGRs, Yield parameters, Growth of guava

Effect on flowers:

The number of flowers per shoot increased significantly by various treatments. Maximum number of flowers (16) per shoot was found in 1000 ppm CCC treatment while it was minimum (8.06) under control (Table 1). The result is in conformity with findings of Blinovskii et al. (1984) who suggested that growth retardant by reducing the annual vegetable growth helps the plant to reserve food which could be used for inducing maximum number of flowers.

Effect on blooming:

Time taken to bloom was influenced due to treatments. Maximum days (15.80) was reported in 100 ppm GA, and a minimum day (8.06) was found in control (Table 1). The delay in blooming of flower bud due to GA treatment might be associated with its action in promoting and diverting the flow of metabolites towards vegetative buds and thus slowed down floral development (Shastry and Muir, 1963; Sachs and Hackell, 1969).

Effect on fruit set:

The highest fruit set per cent (93.13) was observed in 1000 ppm CCC whereas the lowest fruit set per cent (72.43) was found in control (Table 1). Increasing fruit set by CCC due to increase in number of female flowers as reported by Daulta et al. (1981) in mango and also due to their inhibitory effect of growth and thereby diverting the metabolites towards developing fruit as was also reported by Saravanan and Kanowjia (2008) in guava.

Effect on fruit drop:

Fruit drop was significantly influenced by various treatments (Table 1). It was minimum (38.80%) under 50 ppm GA, while maximum (69.53%) was found in control treatment. This action of GA might have raised auxin level leading to diminished drop rate and attributed to its reduction in fruit drop which prevents the formation of abscission layer as reported by Addicot (1970) in apple.

Effect on fruit length and girth:

The maximum fruit size in term of length (9.8 cm) and girth (10.23 cm) was found in 50 ppm GA treatment (Table 1). The reason for increase fruit size in term of length and girth due to GA application might be due to increased level of carbohydrate and GA have stimulated cell division and cell elongation resulting in larger fruit size as reported by Singh and Phogat (1984) and Thakur et al. (1990) in litchi.

Effect on fruit weight and volume:

The fruit weight and volume were significantly influenced by application of various growth regulators in guava (Table 1). The maximum fruit weight (182g) and volume (178.33 cc) were noted in 50 ppm GA, treatment and minimum fruit weight (80.33g) and volume (78.67 cc) were found in control. The reason for increasing in fruit weight and volume under GA, 50 ppm might be due to increase the level of fruit size and accumulation of more pulp. The result is in conformity with the earlier report by Suryanarayan and Dass (1971) in litchi and Pandey et al. (2001) in guava.

Effect on number of fruit at harvest:

The maximum number of fruit (6.20) per shoot at harvest was found in 1000 ppm CCC and it was minimum (3.73) under control. The increase in the number of fruits were associated with increased production of flowers, more fruit setting and retention of more number of fruits per shoot. This result is in

<table>
<thead>
<tr>
<th>Treatments</th>
<th>No. of flowers per shoot</th>
<th>Days required for blooming (50%)</th>
<th>Fruit set per cent</th>
<th>Fruit length (cm)</th>
<th>Fruit girth (cm)</th>
<th>Fruit weight (g)</th>
<th>Fruit volume (cc)</th>
<th>Fruit drop</th>
<th>No. of fruit per shoot at harvest</th>
<th>Yield (kg/p)</th>
<th>B: C ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>8.06</td>
<td>8.06</td>
<td>72.43</td>
<td>5.3</td>
<td>6.17</td>
<td>80.33</td>
<td>78.67</td>
<td>69.53</td>
<td>3.73</td>
<td>12.17</td>
<td>1.10:1</td>
</tr>
<tr>
<td>2,4-D-10 ppm</td>
<td>13.20</td>
<td>9.30</td>
<td>81.20</td>
<td>5.4</td>
<td>6.4</td>
<td>90.33</td>
<td>87.67</td>
<td>58.33</td>
<td>4.20</td>
<td>19.73</td>
<td>1.78:1</td>
</tr>
<tr>
<td>2,4-D-20 ppm</td>
<td>10.80</td>
<td>11.83</td>
<td>81.43</td>
<td>7.6</td>
<td>7.87</td>
<td>110.00</td>
<td>106.33</td>
<td>58.20</td>
<td>4.00</td>
<td>16.23</td>
<td>1.47:1</td>
</tr>
<tr>
<td>NAA-50 ppm</td>
<td>13.90</td>
<td>10.80</td>
<td>83.90</td>
<td>7.8</td>
<td>8.00</td>
<td>108.67</td>
<td>104.67</td>
<td>44.53</td>
<td>6.00</td>
<td>25.97</td>
<td>2.34:1</td>
</tr>
<tr>
<td>NAA-100 ppm</td>
<td>12.60</td>
<td>10.27</td>
<td>89.50</td>
<td>7.9</td>
<td>8.07</td>
<td>109.67</td>
<td>105.67</td>
<td>57.37</td>
<td>4.70</td>
<td>15.70</td>
<td>1.41:1</td>
</tr>
<tr>
<td>GA+-50 ppm</td>
<td>14.70</td>
<td>14.90</td>
<td>80.47</td>
<td>9.8</td>
<td>10.23</td>
<td>182.00</td>
<td>178.33</td>
<td>38.80</td>
<td>4.00</td>
<td>37.13</td>
<td>3.19:1</td>
</tr>
<tr>
<td>GA+-100 ppm</td>
<td>15.67</td>
<td>15.80</td>
<td>86.87</td>
<td>8.4</td>
<td>9.57</td>
<td>144.67</td>
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<td>57.47</td>
<td>5.00</td>
<td>28.93</td>
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<tr>
<td>Ethrel-50 ppm</td>
<td>10.30</td>
<td>8.67</td>
<td>76.03</td>
<td>8.5</td>
<td>8.87</td>
<td>130.67</td>
<td>126.33</td>
<td>48.63</td>
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</tr>
<tr>
<td>Ethrel-100 ppm</td>
<td>8.90</td>
<td>9.30</td>
<td>83.70</td>
<td>5.9</td>
<td>6.57</td>
<td>105.33</td>
<td>100.67</td>
<td>39.53</td>
<td>5.00</td>
<td>26.50</td>
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<tr>
<td>CCC-500 ppm</td>
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<td>7.4</td>
<td>6.13</td>
<td>106.67</td>
<td>112.33</td>
<td>60.00</td>
<td>4.53</td>
<td>24.23</td>
<td>2.05:1</td>
</tr>
<tr>
<td>CCC-1000 ppm</td>
<td>16.00</td>
<td>9.70</td>
<td>93.13</td>
<td>7.8</td>
<td>8.23</td>
<td>117.67</td>
<td>101.33</td>
<td>51.33</td>
<td>6.20</td>
<td>32.53</td>
<td>2.60:1</td>
</tr>
<tr>
<td>S.E. ±</td>
<td>0.42</td>
<td>0.35</td>
<td>0.78</td>
<td>0.08</td>
<td>0.08</td>
<td>1.81</td>
<td>1.71</td>
<td>0.80</td>
<td>0.16</td>
<td>0.47</td>
<td></td>
</tr>
<tr>
<td>C.D. (P=0.05)</td>
<td>0.89</td>
<td>0.73</td>
<td>1.62</td>
<td>0.17</td>
<td>0.17</td>
<td>3.79</td>
<td>3.57</td>
<td>1.67</td>
<td>0.35</td>
<td>0.98</td>
<td></td>
</tr>
</tbody>
</table>
conformity as reported by Desai et al. (1982) in Kagzi lime and Guha (1993) in apple.

Effect on yield:
The fruit retention per shoot at harvest was the final yield of crop. The highest yield (37.13 kg/plant) was found in 50 ppm GA₃ treatment and lowest yield (12.16 kg/plant) was found in control (Table 1). The increase yield under this growth regulators treatment was associated with increase the number of fruit, low percentage of fruit drop, more fruit retention and increased fruit size and weight. This result is in conformity with the earlier report by Shawky et al. (1998) and Shikhamany and Reddy (1989) in grape.

REFERENCES


