PLANT MAPPING OF MEXICAN COTTON CULTIVARS

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Abstract

The objective of this research was to quantify boll set percentage and value of fruiting sites for four cotton cultivars. The study was in 1994 at La Laguna Experiment Station, Mexico. The experimental design was a randomized complete block with four replications. The Mexican varieties Cian Precoz, Cian 95, Launa 89 were compared with the commercial cultivar Deltapine 80. Data was taken on 100 plants on each cultivar to mapped where the harvestable bolls were produced.

Results showed that in modern cultivars Cian Precoz and Cian 95, 78 and 73 % of all harvestable bolls were produced at position one sites on sympodia branches. On the other hand, cultivars Deltapine 80 and Laguna 89 produced 69 and 63 % of all their harvestable bolls at position one. These results indicate that the crop should be managed to provide optimum opportunity for these sites to set and mature bolls.

Introduction

Selection of a cultivar of upland cotton for commercial production is more complex today than in the past. The correct cultivar choice is critical to maximizing good profits. Breeders have developed genotypes that produce high yields in a shorter period than the standard cultivars of the 1970s (Bridge and McDonald, 1987). Jenkins et al. (1990) compared eight cultivars for effectiveness of lint production by fruiting sites. They found that bolls at position one on sympodial branches produced from 66 to 75 % and bolls at position two produced 8 to 21 % of the total yield. Sympodial branches arising from mainstem nodes 6 through 8 were more important to yield on the newer early-maturing varieties.

Palomo et al. (1990) pointed out that Cian 95 was tolerant to Verticillium dahliae K., with a reduction cycle of 7 to 10 days shorter than cultivar Deltapine 80, and had an excellent fiber quality. Palomo and Godoy (1992) indicated that the cultivar Cian Precoz had a high resistance to V. Dahliae K., and was 10 to 15 days earlier than commercial cultivar Deltapine 80.

The cotton plant produce many more fruiting buds than it matures as harvestable bolls. The objective of the present study was to quantify boll set percentage at various fruiting sites to construct plant maps for four cotton cultivars grown in the Comarca Lagunera, Mexico in a high population pattern.

Materials and Methods

This field study was conducted on a naturally *V. dahliae* K. infested soil at La Laguna Experiment Station, Comarca Lagunera , Mexico in 1994. The experimental design was a randomized complete block with four replications. The cultivars evaluated were Cian Precoz, Cian 95, Laguna 89, and the commercial cultivar Deltapine 80.

Planting date was April 22 with a plant population of 100,000 plants/ha. Plots consisted of 12 rows 10 m long with 0.70 m between rows. We recorded the harvestable bolls of 25 plants from each replication, keeping the number of bolls separate by fruiting sites as described by Jenkins *et al*. (1990). These data were converted into percentage of plants with a boll at each fruiting site, and used to construct plant maps.

Results and Discussion

Figures 1, 2, 3 and 4 show the percent of plants that produces a harvestable boll at each fruiting site for the cultivars Cian Precoz, Cian 95, Laguna 89 and Deltapine 80, respectively. Notice, that for all cultivars, the number for first positions is always higher than for second, third or fourth positions. Also notice that for Cian Precoz, at the best sites, nodes 7-13, position one, there are more than 80 percent of the plants with a boll at harvest time. Laguna 89 had its best sites at nodes 6-15, position one, with more than 80 percent of the plants having a boll at harvest time, Figure 2.

Figure 3 shows that, for Cian 95, at the best sites, nodes 6-14, position one, there are more than 80 percent of the plants with an open boll. Finally, data on Figure 4 indicate that for the commercial cultivar Deltapine 80, 80 % of the plants had an open boll on nodes 7-13, position one.

Figure 5 shows the percent of cotton produced at each position on the plant for four cultivars of cotton. We can observe that for each cultivar we had from 63-73 % of the cotton produced from bolls at the first positions. We had from 22 to 29 % of the cotton produced from bolls at the second position. We had less than 5 % of the cotton produced from bolls at position 3 and beyond. The vegetative branches produced from 2-3.5 % of the cotton.

The cultivar Cian Precoz is typical of the modern cultivars we are trying to grow today in Mexico. It is setting more bolls at the first position in the plant. Thus, it is making a crop earlier.

Data from Jenkins (1990) are very similar to these. This indicate that it is a characteristic of cotton cultivars being

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grown today to produce most of the cotton at the first position bolls. The plant however, in midseason has 3 to 5 fruiting positions on many fruiting branches. It is more important to realize, however, that at harvest time most of the open bolls will be at positions one and two only.

Literature Cited

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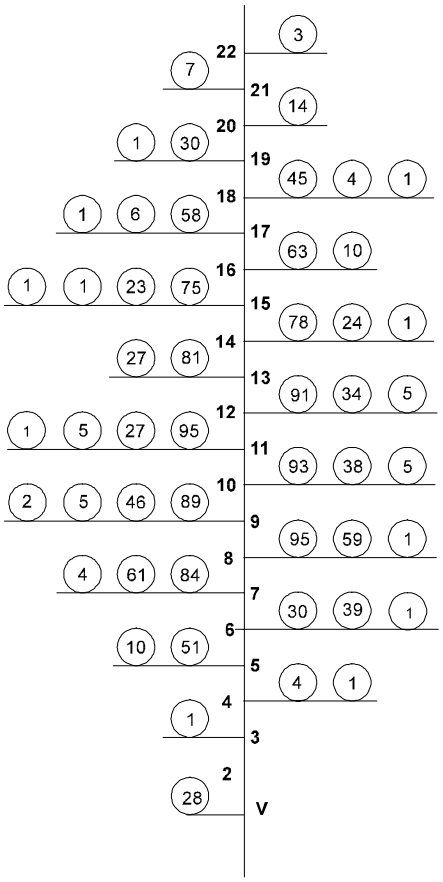

Figure 1. Percent plants with bolls by node and position, cultivar Cian Precoz

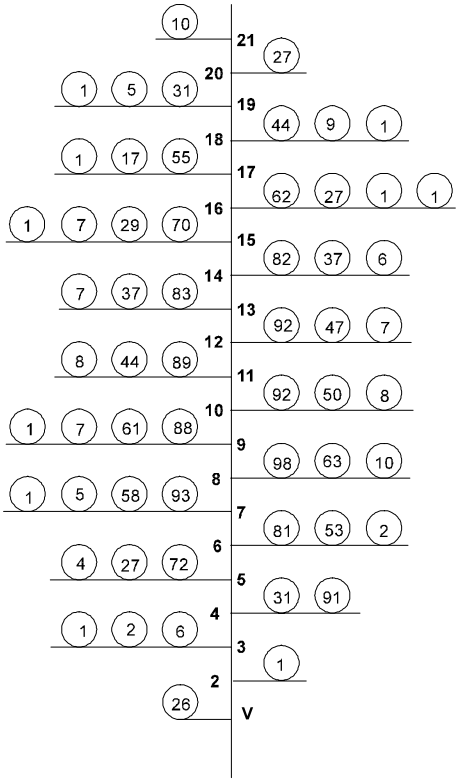

Figure 2. Percent plants with bolls by node and position, cultivar Cian 95

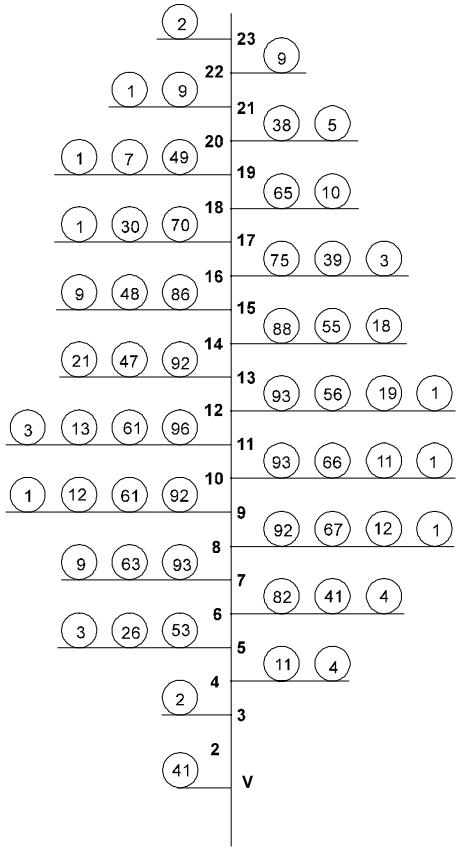

Figure 3. Percent plants with bolls by node and position, cultivar Laguna 89

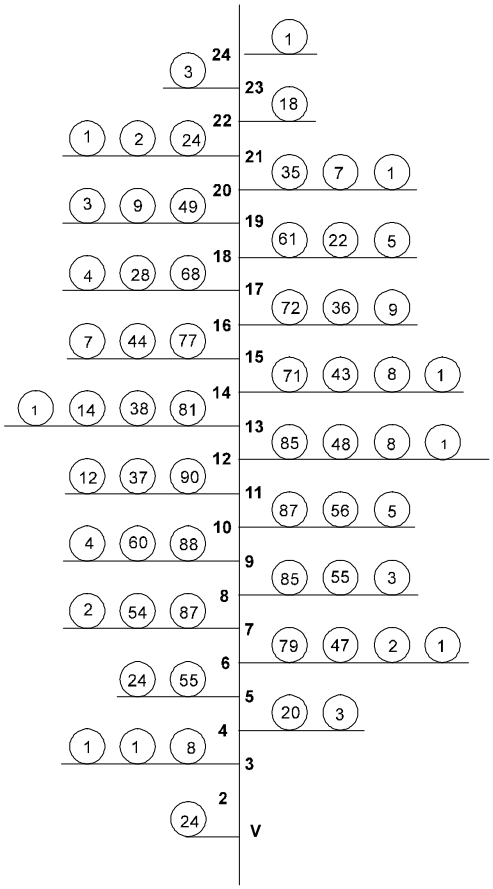

Figure 4. Percent plants with bolls by node and position, cultivar Deltapine 80

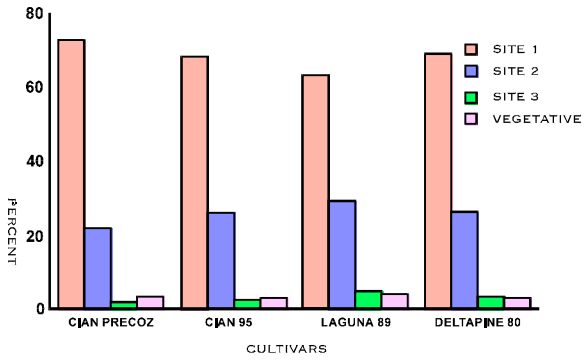

FIGURE 5. PERCENT PLANTS WITH BOLLS BY NODE AND POSITION (MEANS OF FOUR CULTIVARS)