Dynamics of *Aphis gossypii* Glover (Hemiptera: Aphididae) on cotton cultivars with colored fibers.

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1 - Introduction

The cotton plant (*Gossypium hirsutum* Linnaeus) is one the most important crops in Brazil, because it provides fiber, oil and related products (Gonzaga et al. 1991). The cotton with fibers naturally-colored is ecological because it do not need to be dyed using industrial processes.

One of this crop's limiting factors in Brazil is attack by insect pests. The cotton aphid, *Aphis gossypii* Glover (Hemiptera: Aphididae) is a phytophagous, cosmopolitan (Celini and Vaillani 2004) and polyphagous (Oliveira et al. 2008) species that is found during the development phase of cotton plants. High densities of this pest can have negative impacts on cotton production. In Brazil, losses caused by cotton aphid vary from 24% to 40% of cotton lint production (Calcagnolo and Sauer 1954).

Abundance of aphids is generally seasonal, and may vary from year to year. Population fluctuation patterns for an aphid species may also differ between geographic regions, between different populations that have developed in the same region for some years, and between neighboring populations that have developed simultaneously (Cividanes and Santos, 2003). In this direction, knowledge concerning the dynamics of *A. gossypii* on cotton plant is of great importance in developing integrated pest-management programs. Accordingly, the aim of this research was to study the dynamics of the cotton aphid, *A. gossypii* within a cotton plant in two cotton cultivars (BRS Safira and BRS Rubi) with colored fiber, over the time.

2 - Material and Methods

The research was carried out at Experimental Station of the Embrapa Algodão, Campina Grande, Paraíba State, Brazil. A randomized block experimental design was used, with two treatments, composed of colored-fiber cotton cultivars (*Gossypium hirsutum* L.) BRS Safira and BRS Rubi, distributed in five replications, with each experimental unit composed of 25 plants. Measurements of aphid population dynamics in the cotton plants were taken in intervals of seven days, from the moment of plant emergence until the appearance of the first open bolls.

The statistic analyses were made by the softwere Sas Institute 2006. The numbers of apterous and alate aphids recorded per plant were tested for normality (Kolmogorov D: normal test) and homogeneity of variance (Bartlett's test) and square root of (x + 0.5) transformation was used when necessary; however, untransformed means are presented in figure.

3 - Results and Discussion

The results of this study show that the apterous aphids produced population peaks during the season, at 70 (BRS Safira) and 91 (BRS Rubi) days of plant age (Fig. 1), while population peaks of alate aphids were produced at 70 (BRS Safira) and 84 (BRS Rubi) days of plant age (Fig. 1). In addition, for both cotton cultivars, during peak occurrences of apterous and alate aphids, the highest proportional quantities of apterous and alate aphids were observed on nodes in the plants' bottom regions, except for the BRS Rubi cultivar, where the occurrence of alate aphids was proportionally highest in the middle region of the cotton plant.

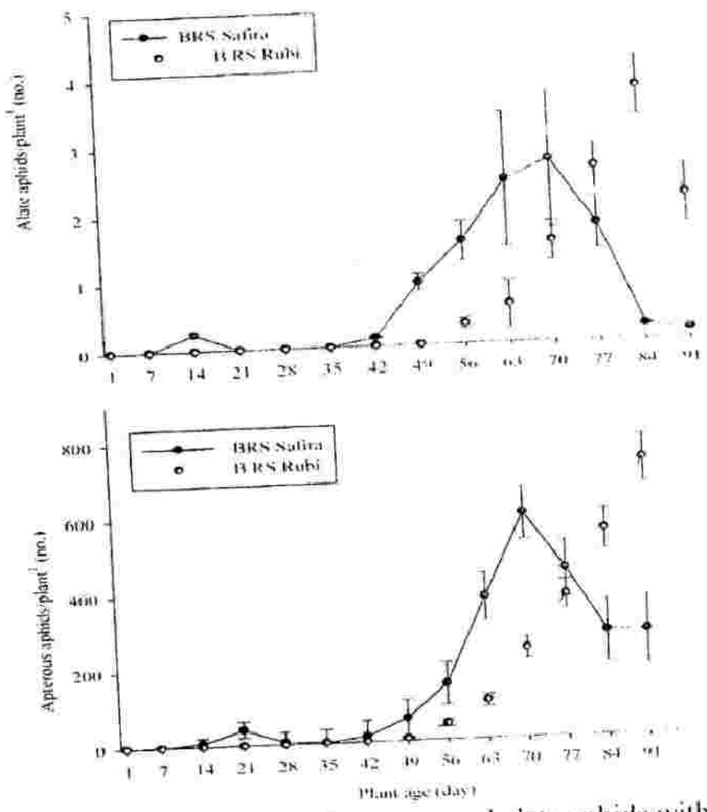

Figure 1. Dynamics of apterous and alate aphids within 2009 season in cotton cultivars (BRS Safira and BRS Rubi) with coloured fibers. [1]All plant structures (leaves, squares, flowers and bolls).

Population peak of apterous aphids at 70 (BRS Safira) and 91 (BRS Rubi) days of plant age or alate aphids

at 70 (BRS Safira) and 84 (BRS Rubi) days of plant age are similar to the results found by Celine and Vaillant (2004), who observed that population growth curves for *A. gossypii* in cotton plants of similar physiological ages present similar behavior. Resende et al. (2004) also recorded population peak of alate *A. gossypii* when cauliflower plants (*Brassica oleracea* Linnaeus) were 77 days old. On the other hand, Pinto et al. (2000) found that green peach aphid (*Myzus persicae* (Sulzer)) tends to present a single population peak during the crop cycle of the potato (*Solanum tuberosum* Linnaeus). However, Kindlmann and Dixon (1996) explained that aphid population dynamics are not characterized by defined patterns, but instead are considered highly variable over the course of the year, particularly when a comparison is made between these insects' mechanisms, which enable their population dynamics to follow either a similar or distinct path.

In terms of the peak occurrences of alate or apterous aphids, the highest proportions of apterous or alate aphids were found on nodes in the bottom region of the cotton plant, except in the BRS Rubi cultivar, where the proportionally highest occurrence of alate aphids was observed in the middle region of the plant. The results for the BRS Safira cultivar agree with those found by Leite et al. (2007), which studying okra crops (*Abelmoschus esculentus* (Linnaeus)), found more apterous individuals of *A. gossypii* in the bottom region of the plant than in the middle and top regions. On the other hand, Cividanes and Santos (2003), which studied apterous aphids of the species *Brevicoryne brassicae* (Linnaeus) in cauliflower plants, found the highest proportion on the leaves of the middle region of the plants and the lowest proportion on the leaves of the top region of the plants. However, us study showed that the dynamics of *A. gossypii* in cotton plants does indeed vary according to cultivar.

The results of this study may prove useful in sampling programs for this pest, as well as in forecasting outbreaks and population peaks of *A. gossypii* and in taking related decisions. They may also help to reduce costs and save time spent on pest monitoring and control activities.

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