

"BUSHY-TOP" SYNDROME ON SEEDLINGS  
AT PIEDMONT NURSERY

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ABSTRACT - \_\_\_For many years, there has been a small percentage of seedlings at Piedmont Nursery that have exhibited the "bushy-top" syndrome. The percentage of seedlings that were "bushy-topped" increased to a 40% figure in 1984 and *has* maintained an average between 10% - 20% since that time. From previous meetings and publications that have been collected, it seems to indicate the "bushy-top" syndrome could be the result of insect damage from one or more specie of *Lygus*. For the last three years, different trapping methods have been used to monitor *Lygus* population and to examine the potential relationship between "bushy-top" and the trapping frequency of *Lygus* spp.

DISCUSSION

When the incidence of multiple-forked seedlings increased at Piedmont Nursery in 1982, the potential causes were examined. Herbicide injury and/or disease were first suspected. Check plots revealed that herbicides were not the cause. Inspections and cultures did not reveal any real disease problem. Even so, there was still multiple forking occurring in the seedlings. A variety of fungicides were used to control any potential disease problem. With the problem still occurring in the seed beds, it was decided several studies should be conducted.

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## 1986 STUDY

In the fall of 1985, the possibility of insect damage was discussed by a few members of the Auburn Nursery Cooperative and was reported by Mr. David South (1986) specifically Lygus and Thrips. With this possibility, a study was put in at Piedmont Nursery in 1986 by a joint cooperative between the U. S. Forest Service, and Mr. Andy Boone, Insect & Disease Staff Forester, S. C. Forestry Commission.

As reported by Mr. Steven W. Oak (1987), the objectives were to identify potential causes of forking with emphasis on insect pests, determine damage levels and types and suggest potential preventative strategies. Equipment used in the study included sticky traps, spray traps, net sweeps in borders, exclusion cages, and isolation cages in greenhouse and seedbeds.

Results of the trapping in seedbeds revealed a variety of insects in the seedbeds. Potential problem insects included Thrips, plant hoppers, and few Lygus. Insects in sweeps in borders revealed the same as in seedbeds, only many more Lygus, up to ten times as many. Caging studies was the most revealing. The isolation cages, whereby Lygus was introduced to a small area of seedlings, revealed that Lygus can cause meristem damage and attendant symptoms (tip die out with Phoma associated, "crater bud", forking with multiple stems). Cages with plant hoppers and the control cages revealed no damage. Damage surveys were low in May with .5 - 1% damage recorded. In mid-June damage increased to 6%.

**Conclusions included the fact Lygus can cause meristem damage and forking. It did not appear that plant hoppers caused damage. It was also felt that there may be other factors causing the forking at Piedmont Nursery such as Thrips and possibly chemical damage.**

Operationally, Malathion, Bravo, and Benlate were applied weekly to reduce the frequency of "bushy-top" seedlings. A 10% - 20% frequency of "bushy-top" seedlings were recorded so success was questionable.

### 1987 STUDY

With the results of the 1986 study and continued discussion within the Auburn Nursery Cooperative about Lygus, a survey was conducted by the Nursery Cooperative at five nurseries in 1987, to determine if (1) Lygus bugs could be trapped in seedbeds, and (2) determine the relationship between the occurrence of Lygus bugs and the onset of seedling injury. Piedmont Nursery was one of the five nurseries surveyed.

Sixteen, white "Rebell" traps were placed in the nursery. Twelve in the seedbeds and four were placed in weedy, border areas. The traps were hung from a bent piece of rebar so the bottom would be about one foot from the ground. The traps had a thin coating of tangletrap that captured any insect that landed on the trap. The number of Lygus were recorded on **Monday, Wednesday, and Friday. Each trap was cleaned with mineral spirits and retreated with tangletrap once a week.**

The traps were very effective in trapping insects, Lygus included. Lygus population in the traps went from an average of 1.0 - 1.9 Lygus/trap in April to a high of 14 - 15 Lygus/trap in the later part of May. Damage in the seedbeds started showing up visually on June 8, 1987. The overall results from the study indicated that the higher population of Lygus present, the greater percentage of injury or "bushy-top" seedlings were recorded. Operationally, Pydrin and Malathion were used to try to reduce the injury. 10% - 15% of the seedlings were "bushy-top".

**In addition to the trapping the Lygus bug, a study to monitor populations of thrips species in the seedbeds and nursery border was**

conducted and their damage was assessed and reported by Oak (1987).

The same traps were used to monitor thrip populations as were the Lygus populations.

Trap estimates were high, averaging between 100 to 1100 thrips per day in seedbeds. "Bushy-top" syndrome was not induced on seedlings when the thrips were caged on susceptible seedlings. It was concluded that control programs targeting thrips are unwarranted.

#### 1988 STUDY

This year, the traps were used again and the population of Lygus trapped went to a high of 3.2 Lygus/trap on May 23, 1988 and 3.0 Lygus/trap on June 3, 1988. Some damage was noticed in the field on June 6, 1988 though the percentage of damage is smaller. If current populations remain constant, the population will be down from last year and so will the damage percentage. Bi-weekly and weekly sprays of Pydrin and Malathion are being used again to try to reduce insect populations.

#### CONCLUSION

Information, obtained from publications, indicates that one or more species of Lygus has caused damage to seedlings in the United States, as well as other countries. The three years that Lygus has been monitored at Piedmont Nursery has shown similar results. Even though one study reported that the use of Pydrin reduced the damage from 33% to 3%, the percent of "bushy-top" seedlings at Piedmont Nursery seems to be in relationship to the population of Lygus. Pydrin does not seem to have an effect on Lygus population.

It is felt that additional research needs to be conducted on other insecticides or additives that would keep the Lygus from inserting their mouthparts into the meristem in the first place. It is felt that this

action causes the damage regardless to whether the insect is killed by the Pydrin after this action. Also, additional research on field plantings of these "bushy—top" seedlings may reveal that the culling of these seedlings may not be necessary and that these seedlings will grow out of this condition.

#### LITERATURE CITED

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