sistently with 'Anna' at Gainesville following both warm and cold winters and pollination tests show that they cross-pollinate each other readily (2, 3).

The 'Dorsett Golden' apple ranges in color from a pale to a light yellow, and often has a pinkish or light red blush similar to that of 'Golden Delicious'. The blush varies covering 10 to 40% of the apple and becomes more intense with cooler nights during the last month before harvest.

The fruit size is dependent on crop load but averages 150 g (5.5 oz) or slightly smaller than 'Anna'. Fruit in large clusters will be smaller. 'Dorsett Golden' fruit are regular in form, mostly round to slightly oblong. Fruit lenticels are scarce and inconspicious. When fully ripe, the flesh is medium firm and slightly crisp. The fruit has a mild apple aroma, is of medium sweetness and is slightly sub-acid.

The trees are highly precocious and begin flowering in the field the second year even on seedling rootstock. Precosity inducing dwarf rootstocks that are commercially available are not adapted to the warm south where they exhibit burrknot. On mature trees at Gainesville, bloom period occurs over approximately 2 weeks from late February to early March, and is more concentrated than for 'Anna', which often begins blooming a week earlier and lasts a week later. Young vigorous trees generally flower 1 to 2 weeks later than older mature trees. The flowers are large, numerous, showey, light pink in the bud stage and white when fully opened. Pollen is light yellow and very abundant.

Based on observations with peaches, the estimated hours of chilling for dormancy requirements is about 300. Both 'Dorsett Golden' and 'Anna' are not as dependent on chilling as peaches in that they will fruit satisfactory with 200 hours or slightly less. When chilling is less than 300 hours, time of bloom and ripening will be delayed. Where winters are not severe enough to induce dormancy, 'Dorsett Golden' will grow as an evergreen, flowering and fruiting throughout the year mostly on terminal growth. Fruit set is generally sparse and fruit shape is elongated on trees grown as an evergreen. Evergreen trees have been observed in Homestead and Miami.

Five year old trees at the University of Florida orchards yielded approximately 80 lbs. (35 kg) each. 'Dorsett Golden' is not self-fertile, but sets fruit readily when bee-pollinated from near by trees of 'Anna' (2, 3). Best pollination is assured when 'Anna' is within 100 feet.

'Dorsett Golden' trees are similar to those of Anna being moderately vigorous and upright-spreading. The tree is spur type but sets fruit occasionally on vigorous whips. Lenticels on vigorous young whips are large, whitish, and widely scattered. 'Dorsett Golden' has a high level of resistance to powdery mildew, in contrast to 'Anna' which is very susceptible. Fire blight has never been observed on 'Dorsett Golden' in Gainesville.

Literature Cited

1. Brooks, R. M. and H. P. Olmo. 1972. Register of new fruit and nut varieties: 2nd Edition. Univ. of Calif. Press. Berkeley, CA.
2. Crocker, T. E., M. L. DuBois and W. B. Sherman. 1978. Fruitfullness of apples in Florida. *Proc. Trop. Reg. Amer. Soc. Hort. Sci.* 21: (in press).
3. ————, W. B. Sherman and R. J. Knight. 1979. Self-unfruitfullness of 'Anna' apple. *Fruit Varieties J.* 33(2):65-66.
4. Lieberman, C. B., T. E. Crocker and A. J. Snapp. 1977. The subtropical apples six years after distribution. *Fla. State Hort. Soc. Proc.* 90:222-228.
5. Oppenheimer, C. H. and E. Slor. 1968. Breeding apples for a subtropical climate. *Theoretical and App. Genetics* 38:97-102.
6. Rowland, E. H. 1977. Low-chilling apples for Florida. *Fla. State Hort. Soc. Proc.* 90:224-225.
7. Sharpe, R. H., C. E. Arnold and W. B. Sherman. 1972. Temperate fruit breeding and development in subtropical Florida. *Proc. Trop. Reg. Amer. Soc. Hort. Sci.* 16:107-114.
8. ———— and J. S. Shoemaker. 1958. Development of temperate-climate fruits for Florida. *Fla. State Hort. Soc. Proc.* 71:294-300.

Proc. Fla. State Hort. Soc. 93:109-110. 1980.

INCIDENCE OF ALGAL DISEASE (CEPHALEUROS SP.) IN SELECTIONS OF GUAVA (PSIDIUM GUAJAVA)[1]

R. B. MARLATT AND C. W. CAMPBELL
University of Florida, IFAS,
Agricultural Research and Education Center,
18905 S.W. 280 Street, Homestead, FL 33031

Additional index words. algae, *Chlorophyta,* disease resistance, red rust.

Abstract. **A pathogenic green alga,** Cephaleuros, **sp., seriously injures leaves and fruits of guava,** Psidium guajava **L., in southern Florida. Five guava selections in a grove were compared for susceptibility to this algal disease. 'Patillo' and 'Blitch' had a low disease incidence, 'Ruby x Supreme 6-29' was moderately damaged whereas 'Webber x Supreme' and 'Ruby x Supreme 10-30' showed the most disease.**

Among the several algae which live on or within vascular plants, *Cephaleuros* is the most damaging. *Cephaleuros virescens* is the binomial commonly applied to the species occurring in Florida; however, the general taxonomy of the genus has received relatively little attention and no taxonomic study has been made in Florida. Therefore, the pathogen discussed here will be referred to merely as *Cephaleuros* sp. It is one of the green algae and its vegetative stage can be various shades of green. It is often mistakenly called "red rust" because the upper surface of the thallus produces erect, yellow to red filaments and fruiting bodies during the wet summer. Its thallus is made of flat, short, closely crowded, branched filaments beneath which are irregularly branched rhizoids. The most obvious fruiting bodies consist of upright, multicellular filaments bearing 1-8, sharply bent pedicels. Each pedicel bears a pear-shaped or nearly spherical sporangium which eventually emits about 8-32 motile, biflagellate spores.

Approximately 50 hosts have been reported in Florida (4) and depending upon the host, the alga can be harmless or extremely damaging to foliage, branches or fruits. No statistically designed experiment involving measurement of varietal resistance to this pathogen has ever been reported. One observer in India stated that the Assam type of tea appeared to be the most susceptible to algal damage and the 'Manipuri' variety was the most resistant (2). In a Florida tangerine grove, the 'Lee' cultivar appeared to be

[1]Florida Agricultural Experiment Station Journal Series No. 2538.

Table 1. Algal (*Cephaleuros* sp.) disease incidence in guava selections, August to January.

Selection	Aug.	Early Sept.	Late Sept.	Oct.	Nov.	Dec.-Jan.
Patillo	4.3 a[z]	4.3 a	7.1 a	6.5 ab	3.6 a	3.5 a
Blitch	6.0 b	6.8 b	5.5 a	6.0 a	5.2 ab	5.5 b
Ruby x Supreme 6-29	6.8 bc	7.6 bc	5.7 a	6.5 ab	6.7 b	6.9 c
Webber x Supreme	7.7 c	8.4 c	6.4 ab	8.4 bc	9.2 c	9.5 d
Ruby x Supreme	7.3 c	8.5 c	8.3 b	10.0 c	9.7 c	10.0 d

[z]Mean rating of 15 replications. Ratings followed by the same letter were not significantly different at the 1% level.

more susceptible to bark injury than 'Osceola' or 'Robinson' but its position in the planting might have been responsible for the difference (1).

This article describes an experiment that detected differences in disease incidence among selections of guava in a randomized, replicated planting at the Agricultural Research and Education Center in Homestead.

Cephaleuros infects immature guava leaves during the early spring flush of new foliage (3). Minute, brown specks of dead tissue extend through the entire lamina and these lesions may gradually enlarge to 2-3 mm diameter or larger if lesions coalesce. Leaf tips, margins or areas near the midvein are most often infected. On immature fruits the lesions are nearly black. As fruits enlarge, lesions are sunken and the appearance of the fruit is severely blemished.

The etiology of *Cephaleuros* disease of guava differs from the effects of the alga on the majority of its hosts. Usually, an obvious algal thallus develops on the upper surface of a host leaf and the tissues beneath the thallus sometimes gradually die. A lesion may be restricted to the epidermis or pallisade layers or may eventually involve the entire lamina and appear on the leaf underside as well. Sporulation usually occurs on the thallus surface. On guava, contrary to other hosts, no thallus is apparent on the upper leaf surface, the lesion extends through the entire lamina soon after it appears and the sporulation occurs on the lesion surface on the underside of the leaf.

Materials and Methods

A 10-year-old grove containing five guava clones randomly planted in each of 15 blocks at the Agricultural Research and Education Center in Homestead was utilized in this study. Selections included 'Ruby x Supreme 6-29', 'Ruby x Supreme 10-30', 'Webber x Supreme', 'Blitch' and 'Patillo'. 'Ruby x Supreme' selections are sweet, low-acid guavas which are popular for both fresh consumption and processing. 'Patillo' is a moderately acid fruit and 'Blitch' is highly acid, both are suitable primarily for processing.

Trees were visually rated monthly for disease incidence from August, 1979 to January, 1980. Disease incidence was rated 1 if 0 to 20% of the leaves were spotted, 3 if 20 to 40% were diseased, 5—40 to 60%, 7—60 to 80% and 9—80 to 100%. Ratings were compared by analysis of variance and Duncan's multiple range test.

Results and Discussion

'Webber x Supreme' and 'Ruby x Supreme 10-30' exhibited high algal disease incidence, 'Patillo' and 'Blitch' had low disease incidence and 'Ruby x Supreme 6-29' displayed moderate incidence (Table 1). Disease on 'Patillo' appeared to peak during late September and October whereas 'Ruby x Supreme 10-30' and 'Webber x Supreme' seemed to have more diseased leaves in late fall and winter. Relative susceptibility of the selections was most obvious in December and January.

The alga sporulated readily during July through September, the period of greatest rainfall. Flushes of new growth displayed no symptoms during late summer, fall and winter. Normal leaf fall occurs during the dry, cool winter months; therefore, the percentage of diseased leaves varied as healthy foliage developed and old leaves fell. For this reason little seasonal change of disease incidence was shown by the data.

Very little information about the relative susceptibility of cultivars and selections of tropical fruits to damage by *Cephaleuros* appear to be available. In the case of guavas, this may be due to the fact that thresholds for fruit damage are high for fruit destined for processing and the majority of guavas for fresh-market consumption are sold in developing countries where superficial fruit blemishes are considered to be unimportant. This disease can severely diminish photosynthetic leaf surface and it can most likely cause premature defoliation. Because of this damage fruit yields are probably lowered. These results indicate that varietal differences in susceptibility to this algal pathogen may be more common among tropical fruits than has been supposed.

Literature Cited

1. Knorr, L. C. 1964. A suggestion that the Lee tangerine may be hypersensitive to *Cephaleuros virescens*. *Plant Dis. Rptr.* 48:478-479.
2. Petch, T. 1923. The diseases of the tea bush. MacMillan & Co., Ltd., St. Martin's St., London. 220 pp.
3. Ruehle, G. D. 1941. Algal leaf and fruit spot of guava. *Phytopathology* 31:95-96.
4. Suit, R. F., and E. P. DuCharme. 1946. The *Cephaleuros* disease of *Citrus*. *Citrus Ind.* 27:3.