leaf hopper, crown and root rots, etc. The final result of this early release should be better varieties for more growers in a shorter period of time.

Parentage

SW44 is a 16-clone synthetic strain selected from four experimental synthetics that had been grown in a yield trial (at the A. Tognazzini Ranch, Guadalupe) heavily damaged by stem nematode and infected with leaf and stem diseases. One-half the parent plants came from African-type varieties and the other one-half were tall-growing plants from a Caliverde-type variety. Parentage traces to African (42.6%), Caliverde (37.5%), Lahontan (18.6%), and Sirsa (1.6%).

Characteristics

Forage production of SW44 (table 1) was equal to or better than Moapa at El Centro and Davis through the first production year. Production improved during the second and third years at Davis and during the third year at El Centro. Reaction to the pea aphid and spotted alfalfa aphid (table 2) compares favorably with other varieties. Observations on plant height, Stemphylium leaf spot, and stand (table 3) made in the humid coastal environment of Santa Maria, California, where stem nematode and leaf and stem diseases were a problem, indicate that SW44 was superior to other named varieties in this environment. The nature of the material indicates that through adequate screening techniques and breeding methods such as recurrent selection, improvements can be made in nondormancy resistance to stem nematode and leaf and stem diseases.

Seed requests

Seed will be provided to plant breeders upon written request and agreement to make appropriate recognition of its use as a matter of open record when this germplasm contributes to the development of a new variety or hybrid. Send requests to the Department of Agronomy and Range Science, University of California, Davis, California 95616.

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A progress report . . .

CITRUS RESPONSE TO REI

S. B. BOSWELL

CITRUS BUD GROWTH IN MILLIMETERS—MEAN AVERAGE FOR DATES SHOWN

	9/3	9/8	9/13	10/3	10/28	1/2/69
*Nucellar Lisbon	5.74	12.33	17.70	27.00	27.00	52.75
Nucellar Lisbon Control	2.33	6.05	9.34	15.56	15.56	41.12
*Nucellar Eureka	3.59	8.88	14.60	22.87	22.87	54.50
Nucellar Eureka Control	2.74	6.90	11.40	18.37	18.37	41.62
*Nucellar Campbell	2.02	5.55	10.37	22.30	22.30	22.30
Nucellar Campbell Control	.99	2.53	5.87	20.33	20.33	20.33
*Frost Nucellar Wash.	2.58	5.74	9.88	24.60	24.60	24.60
Frost Nucellar Wash. Control	2.55	5.49	9.13	24.55	24.55	24.55

* The apex and leaves removed from budwood while on the tree.

IT HAS BEEN KNOWN for many years that the apical buds inhibit the growth and development of lateral buds. This inhibition is largely due to growth regulators produced by the apical shoot and leaves. Other researchers have reported that buds are also inhibited by the presence of growing leaves—and that in several herbaceous species, the expanded leaves partially inhibited their axillary buds. Long after the removal of the terminal buds, the leaves delayed axillary bud growth. Defoliation has been shown to significantly accelerate bud growth of *Poncirus trifoliata.* However, length of time to bud growth varied with the season. The addition of 1 per cent NAA in lanolin paste to the leaf scars of defoliated plants inhibited bud growth. This auxin produced by the leaves may be responsible for inhibition of bud growth, as is auxin produced by the apical bud.

Reduced inhibition

The reduction in inhibition by removal of apical shoot and leaves suggests that removal of the apical shoot and leaves from budwood prior to its removal from the tree might shorten the time to bud-growth after budding. This progress report details the results of one greenhouse test, during the summer, 1968. Additional work is now under way on the removal of the apex and leaves of budwood while the bud is still on the tree so that the citrus buds will be stimulated.

Four varieties

Four citrus varieties, Nucellar Eureka lemon, Nucellar Lisbon lemon, Nucellar Campbell Valencia orange, and Frost Nucellar Washington Navel orange were used in this test. Treated budwood was cut two weeks after the apical bud and leaves were removed from each prospective budstick. Budwood for control was cut at the same time from twigs from which the apical bud and leaves had not been removed. All budwood was collected and budded into 2-year-old Rough lemon seedlings on August 8, 1968. Three buds were placed in each seedling, with two plants per one gallon pot. Seedlings and budlings were grown in a greenhouse with a range of 60°F night to 90°F day temperatures.

Ninety-six buds were used on the Eureka and Lisbon lemon varieties, of which 48 buds were used as a control. One hundred and twenty buds were tested on the Navel and Valencia orange varieties, with one-half of them used as a control. To force the buds, all seedlings were bent over on August 20 and all tops

EMOVED TERMINAL BUDS AND LEAVES

completely removed on September 5. An asphalt emulsion tree seal was applied to each stub at the time of top removal. It was necessary to remove the top early for convenience in taking growth measurements. Shoots with the terminal-inhibiting apical bud and leaves removed began to push buds about four days before the control trees of all varieties. The table shows the average growth rate in millimeters.

After the September 13 measurements, only one shoot was left on each seedling. The buds that came out first maintained faster growth than the check. Shoot elongation ceased between Nov. 3 and Nov. 28, because that flush-growth period had terminated. A new flush began after Nov. 22 measurements on the lemon varieties, but no measurable shoot elongation has occurred on the orange varieties since Nov. 3. All the buds appeared to callous in about the same time, regardless of which of the two methods was used. Each time the shoot elongation was measured, observations were made of the bud inserted area for any growth disorder. To date there seems to be no difference in bud union between any of the young trees.

Several questions remain to be answered on the removal of apex and leaves from citrus budwood while still on the tree:

(1) will the buds continue their rate of growth in the greenhouse? (2) will the trees from budwood with their apex and leaves removed produce a faster growing tree in the nursery? (3) are the citrus buds stimulated by removal of the apex, leaves, or both, when inserted into citrus seedlings? (4) will the season of the year affect the length of time budwood should stay on the trees after its apex and leaves have been removed? (5) what effect does removal of apical dominance have upon the balance of growth regulator adjacent to the buds?

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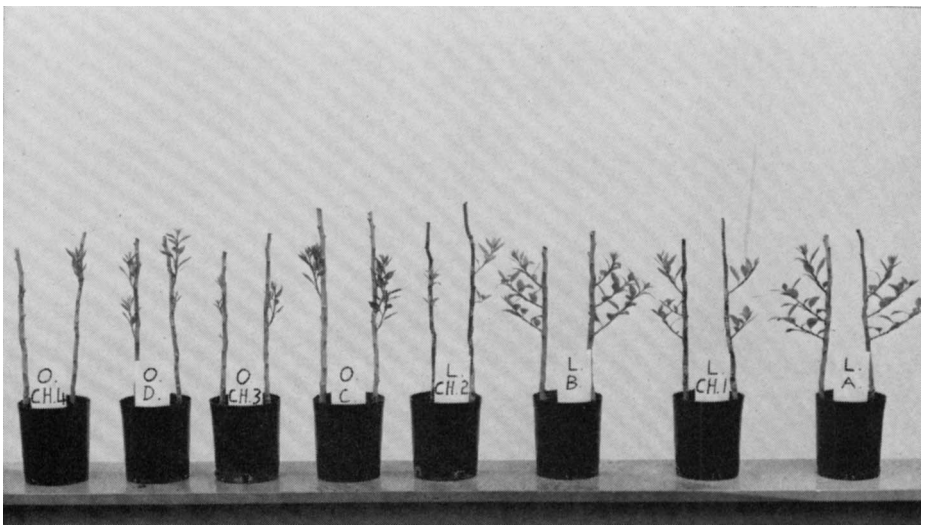

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