

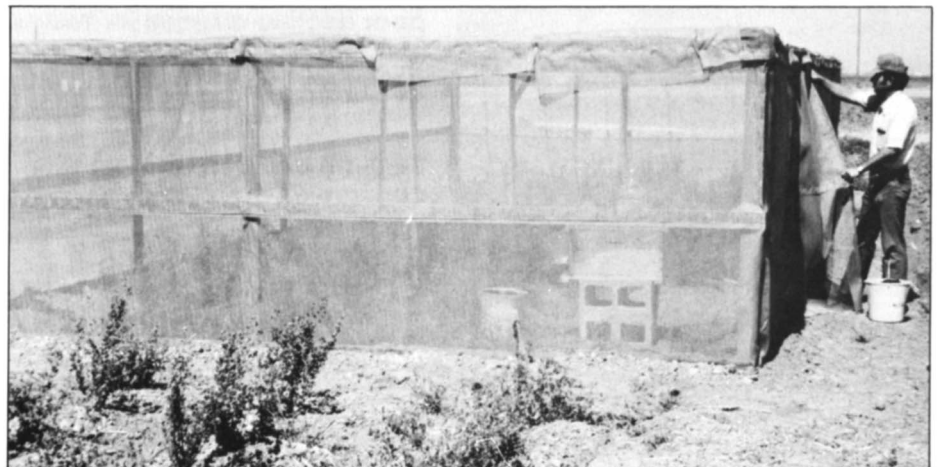
CUF 101, a new variety of alfalfa is resistant to the blue alfalfa aphid

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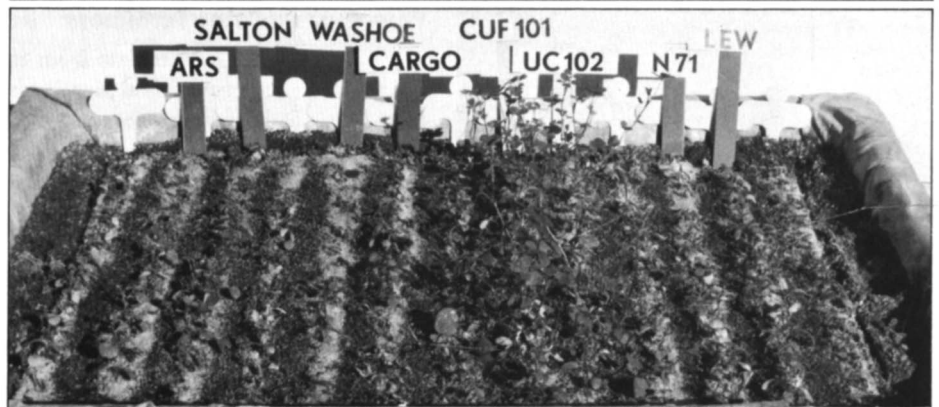
Resistant (right) and susceptible alfalfa plants growing in the field from which the parent plants of CUF 101 were selected.



Seed of CUF 101 was produced in a cage a few months after plants with resistance to blue alfalfa aphid were selected. Half of the seed produced was used in evaluation experiments, and half for seed increase.



A greenhouse-flat test showing 45 to 53% survival for CUF 101 and UC 102 (a sister selection) subjected to heavy populations of the blue alfalfa aphid. Less than 2% of the plants of other varieties survived.



A new, resistant variety of alfalfa was quickly developed once the blue alfalfa aphid was recognized as a pest.

Plants with resistance to the blue alfalfa aphid (*Acyrtosiphon kondoi*) were selected within one month of determining that the blue alfalfa aphid was a new pest of alfalfa in California. Seed was produced a few months later. Tests confirmed that the new variety (named CUF 101) was resistant to this new pest.

Later tests showed that CUF 101 was also resistant to the spotted alfalfa aphid (*Therioaphis maculata*) and pea aphid (*A. pisum*) and had moderate resistance to phytophthora root rot. It is highly nondormant, purple-flowered, and upright-growing, and is expected to be adapted to areas of California and Arizona where UC Cargo is grown and where winter forage is desired. It was named after the groups that contributed toward its successful development: the University of California (C), U.S. Department of Agriculture (U), and the Farmers (F).

Parentage

The parent plants of CUF 101 were selected from a 2½-year-old hay-production field which had been overirrigated through the life of the stand and infested with the blue alfalfa aphid for about six weeks before the selections were made. About 80 percent of the parentage of CUF 101 can be traced to UC Cargo, and the remainder to nondormant plant introductions, germplasm from the University of California breeding program, and Niagara N-71 Brand.

Forage production

Under attack by the blue alfalfa aphid, CUF 101 had better forage production than all other varieties tested with it at El Centro (table 1). CUF 101 remained superior to the other varieties when all nine cuttings were averaged for this test in 1976. When the blue alfalfa aphid was absent, however, there was no significant statistical difference between CUF 101 and the high-yielding varieties in some of the cuttings.

At Five Points, CUF 101 produced similarly to or better than other commonly grown varieties (Moapa 69, UC Cargo, WL 512, and AS13R). At Davis, production of CUF 101 was also similar

to varieties grown in the area (Lahonton, DeKalb Brand 185, Eldorado R, WL 508, and WL 512). However, information is available for only the first year of production and yields could change in subsequent years.

Reaction to insects and diseases

CUF 101 has multiple resistance to insects and diseases. Resistance to the three aphids attacking alfalfa (the blue alfalfa aphid, spotted alfalfa aphid, and pea aphid) was equal to or better than that of the other varieties tested (table 2). Only ARS-PA, an unreleased variety, was superior to CUF 101 in resistance to pea aphid. Dawson, Kanza, and the other varieties used were chosen because they

were among the varieties with best resistance to spotted alfalfa aphid and pea aphid.

In field experiments at El Centro, CUF 101 had moderate resistance to phytophthora root rot, better than that of UC Cargo, Moapa 69, and Mesa Sirsa (table 3).

Adaptation

For hay production, CUF 101 is expected to be adapted best to the low desert valleys of California and Arizona where UC Cargo is grown. It should be adapted also to areas of the southern San Joaquin Valley of California where UC Cargo can be grown successfully. CUF 101 is not expected to be adapted as far north as Moapa 69.

The precise area of adaptation in the Central Valley is not known. Tests are presently being conducted which should determine this.

Seed availability

Foundation seed of CUF 101 can be obtained from the California and Arizona Crop Improvement associations. Certified seed will be available for hay production in the fall of 1977.

Under certification the classes of seed will be breeder, foundation, and certified. Breeder seed will be maintained by the University of California Department of Agronomy and Range Science, Davis. Areas of seed production and maximum eligibility of stand life of CUF 101 to produce a given class of seed will be determined by the certifying agency; otherwise certification requirements are the same as for other alfalfa varieties.

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TABLE 1. Yield of CUF 101 and Other Alfalfa Varieties Grown at Three Locations for One Year in California

Variety	Yield in tons per acre in 1976			
	El Centro*		Five Points†	Davis‡
	Cut 1	All cuttings		
CUF 101	1.08	12.6	6.60	6.32
UC Salton	0.87	11.1	—	—
UC Cargo	0.74	11.7	6.20	—
Moapa 69	0.63	8.9	6.08	5.98
Mesa Sirsa	0.85	10.0	—	—
WL 508	0.77	10.1	—	6.35
Converde 95 Brand	—	—	7.06	6.07
WL 512	—	—	5.93	6.18
DeKalb Brand 185R	—	—	—	5.63
El Dorado R	—	—	—	5.92
AS13R	—	—	6.01	6.08
LSD 0.05	0.11	0.81	0.59	0.44
Entries in test [§]	10	10	35	18

*Yield was obtained as green weight and converted to tons of dry matter per acre by using a dry matter of 25%. Blue alfalfa aphids were severe on the first of the nine cuttings. Planted October 3, 1975.

†Planted March 12, 1976. Five cuttings.

‡Five cuttings. Since the first cutting was weedy, no yield data were taken from it.

§Varieties not shown in table are experimental or definitely unadapted to the area.

TABLE 2. Comparative Resistance of 9 Alfalfa Varieties to 3 Species of Aphids in Greenhouse Evaluation Tests, Tucson, Arizona, 1976.

Entry	Mean % seedling survival*		
	Blue alfalfa aphid	Pea aphid	Spotted alfalfa aphid
CUF 101	70.29a	70.94b	87.32ab
ARS-PA†	25.78b	85.61a	72.75cd
Kanza	23.37b	70.94b	68.55d
Dawson	23.37b	69.51b	72.00cd
Washoe	19.86bc	56.43c	67.15d
Lew	19.24c	46.25d	80.24bc
MSTT‡	11.93c	23.98e	93.32a
Caliverde(ck)	0.0	0.0	8.0

*Means followed by the same letter(s) are not significantly different at the 0.05 level of probability.

†Unreleased variety with very high resistance to pea aphid.

‡Unreleased variety with very high resistance to spotted alfalfa aphid.

TABLE 3. Reaction of Alfalfa Varieties to Phytophthora Root Rot in a Field Test Grown Near El Centro, California*

Cultivar	Resistant	Intermediate	Susceptible
	1 + 2	3	4 + 5
CUF 101	21.5	29.6	49.2
UC Salton	9.2	24.4	66.4
UC Cargo	14.0	31.7	54.4
Moapa 69	5.5	9.1	85.3
Mesa Sirsa	8.1	8.6	83.3
LSD 10	6.6	7.9	4.7
LSD 05	8.0	9.5	11.7
Varieties in test†	8.0		

*Planting date was November 12, 1975.

†Varieties not included in table are experimental varieties.