

BLUE ALFALFA APHID RESISTANCE

Test accepted: March, 1991

Pest: *Acyrtosiphon kondoi* Shinji

Test updated: June 2022

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PLANT CULTURE

Greenhouse

Container Flat (6 x 31 x 55 cm or similar size)

Medium Soil mix (eg. 8 parts sand; 3 peat; 3 perlite; 1.4% by vol. lime)

Temp/Light..... 22±4° C; 16+ hour daylength

No. of Plants 50 to 70 per replicate in rows 3 cm apart

No. of Repls 3 minimum

Other Scarify seed and treat with fungicide to prevent damping-off; sow seed 1 cm deep and cover with vermiculite

APHID COLONY

Source Colony consisting of blend of several field collections from area of adaptation, replenished annually

Rearing Susceptible alfalfa in greenhouse (eg. PA-1, Riley)

Temp/Light..... 22±4°C and 16+ hour daylength

INFESTATION PROCEDURE

Age of Plant 1 day after emergence; cotyledon stage; count seedlings at time of infestation

Method Sprinkle aphids onto seedlings

Rate Minimum of 2 aphids per seedling

Length..... Approximately 21 days; spray with malathion or diazinon to terminate infestation; rate plants 7 to 10 days after spraying

Other It is critical to maintain temperature within the range of 18 to 26°C for optimal aphid reproduction and effective resistance evaluation

RATING FOR TOLERANCE

1 Resistant..... Tall, normal trifoliolates

2 Resistant..... Tall, small trifoliolates

3 Resistant..... Moderately tall, small, crinkled trifoliolates

4 Susceptible..... Short; small, crinkled trifoliolates, usually chlorotic

5 Susceptible..... Dead = total emerged- (classes 1 to 4)

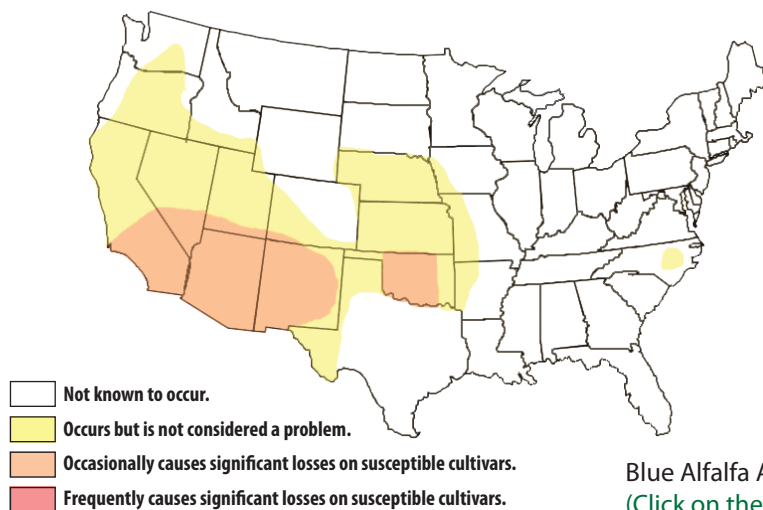
CHECK CULTIVARS

	Approximate Expected Resistance (%)	Acceptable Range of Resistance (%)
Resistant		
CUF- 101 **	55	40-65
OK 51 (OK State)	40	30-60
Susceptible		
PA-1**	10	5-15
Arc	2	0-5
Caliverde**	3	0-5

Values for resistant standards are totals for ratings 1 to 3. Percentage of plants surviving may be higher but may include many with little or no resistance.

**Standard checks used for reporting resistance to the AOSCA Alfalfa & Misc. Legumes Variety Review Board.

DISTRIBUTION AND SEVERITY OF BLUE ALFALFA APHID



Blue Alfalfa Aphid, *Acyrtosiphon kondoi* Shinji
(Click on the map above for a larger version.)

SCIENTIST WITH EXPERTISE

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CORRELATION TO FIELD REACTION

Although there have not been extensive comparisons of greenhouse and field results, it appears that levels of resistance are comparable in both situations.

BIOTYPES

Although biotypes of blue alfalfa aphid are not proven to exist, there is evidence of differential reactions to resistant plants in different locations.

HELPFUL INFORMATION

Use of cultivars for rearing blue alfalfa aphids that have resistance to spotted alfalfa aphid and pea aphid, such as PA-1, may help to prevent colony contamination. The best procedure for collecting aphids from fields for colony establishment is tapping from infested stems. Fewer will be injured and chances of including natural enemies will be much reduced compared to sweeping. Field-collected aphids should be held in isolation for 2 to 3 weeks to check for presence of parasites.

ALTERNATIVE METHOD

A field-cage technique has been used for evaluating blue alfalfa aphid resistance in the Southwest. Rows of PA-1 are planted in plots during fall. In spring, plots are caged and alfalfa is infested by sprinkling aphids over plants. As the aphid population increases, test entries and additional rows of PA-1 are planted between established rows of PA-1. As the test entries emerge, seedlings are counted and established rows of PA-1 are cut back to force aphids onto seedlings. When rows of spring-sown PA-1 have been killed, the infestation is terminated by spraying with malathion, and the numbers of surviving plants in the test entries are counted and compared with original plant counts to calculate % resistant plants.

REFERENCES

1. Ellsberry, M.M., and M.W. Nielson. 1981. [Comparative host plant range studies of the blue alfalfa aphid, *Acyrtosiphon kondoi* Shinji, and the pea aphid, *A. pisum* \(Harris\) \(Homoptera: Aphididae\)](#). USDA Tech. Bull. No. 1639.
2. Lloyd, D.L., B.A. Franzmann, and T.B. Hilder. 1983. [Resistance of lucerne lines at different stages of plant growth to spotted alfalfa aphid and blue-green aphid](#). Aust. J. Exp. Agric. Anim. Husb. 23:288-293.
3. Nielson, M.W., W.F. Lehman, and R.T. Kodet. 1976. [Resistance in alfalfa to *Acyrtosiphon kondoi*](#). J. Econ. Entomol. 69:471-472.
4. Zarrabi, A.A., J.L. Caddel, and R.C. Berberet. 1985. [Blue alfalfa aphid resistance evaluation as affected by seedling age](#). Proc. Central Alf. Imp. Conf. 19:26-27.