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A DISEASE RESISTANT AND COLD HARDY PLUM SEEDLING (for use in breeding)

CIRCULAR 230
SEPTEMBER 1976

AGRICULTURAL EXPERIMENT STATION
AUBURN UNIVERSITY
R. Dennis Rouse, Director
Auburn, Alabama

BRUCE 12-4
A Disease Resistant and Cold Hardy Plum Seedling for Use in Breeding

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BRUCE 12-4, a plum seedling developed by the Alabama Agricultural Experiment Station, is being released for use in breeding. It possesses an unusual combination of disease resistance, cold hardiness, tree longevity, and other characteristics useful in breeding programs. This seedling has consistently produced high yields of fruit each year in central Alabama. Chilling requirement of Bruce 12-4 is 700 hours of temperature below 45°F.

ORIGIN

Bruce 12-4 was selected from a cross of 'Bruce' (*Prunus salicinia* × *P. munsoniana*) × 'Methley' (*P. salicinia* × *P. cerasifera*). The cross was made in 1961 and the seedling was selected in 1963. It was evaluated under the number Bruce 12-4.

DESCRIPTION

Bruce 12-4 is highly resistant to bacterial canker (*Pseudomonas syringae*) and black knot (*Dibotryon morbosum*), tables 1 and 2. It has a moderate level of resistance to bacterial fruit spot and bacterial leaf spot (*Xanthomonas pruni*). Tree longevity is greater for Bruce 12-4 than for the standard 'Bruce.'

Trees are similar to 'Bruce' (growth habit spreading with medium green foliage) except they are more vigorous and larger.

Fruit of Bruce 12-4 have a vivid red (5 R 5/13)[1] skin and a light orange (2.5 Y R 8/6) flesh, Table 3. The fruit, usually 1¾ to 2 inches in diameter and cling, are of fair to poor quality that makes Bruce 12-4 less desirable than Crimson, Purple, and Homeside for home and roadside markets. Fruit have inadequate firmness and storage quality for handling, packing, and shipping to

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[1] Nickerson Color Fan, Maximum Chroma, 40 hues, Nickerson Color Company, Inc.

TABLE 1. DISEASE RESISTANCE OF PLUM VARIETIES IN EXPERIMENTAL PLANTINGS AT AUBURN, CAMP HILL, CLANTON, CULLMAN, FAIRHOPE, AND HEADLAND, 1965-74

Variety	Disease index[1]					
	Bacterial fruit spot	Bacterial leaf spot	Bacterial canker	Black knot	Brown rot	Average
Bruce	0	0	0	0	4	0.8
Bruce 12-4	1	1	0	0	4	1.2
Crimson	0	0	0	0	1	0.2
Methley	3	5	5	5	3	4.2
Homeside	0	0	1	1	3	1.0
Ozark Premier	0	1	1	1	3	1.2
Purple	0	0	0	0	3	0.6
Santa Rosa	5	5	5	0	3	3.6

[1] Disease index: 0 = 0, 1 = 1-20, 2 = 21-40, 3 = 41-60, 4 = 61-80, and 5 = 81-100 percent of fruit, leaves, and tree infected with bacterial canker, bacterial fruit spot, bacterial leaf spot, and black knot.

TABLE 2. DISEASE INDEX RATINGS FOR BLACK KNOT, BACTERIAL CANKER, BACTERIAL LEAF SPOT, AND BACTERIAL FRUIT SPOT OF PLUM VARIETIES IN FIVE GROWER ORCHARDS, 1974

Entry	Number of trees		Disease index rating[1]				
	Planted	Living	Black knot	Bacterial canker	Bacterial leaf spot	Bacterial fruit spot	Average
Crimson	1,087	1,061	0.0	0.0	0.3	0.0	0.08
Bruce 12-4	110	110	0.0	0.0	0.0	0.0	0.00
Methley	275	239	4.5	5.0	5.0	5.0	4.87
Homeside	278	251	0.7	0.4	0.4	0.0	0.36
Ozark Premier	375	180	0.7	1.3	2.0	0.0	0.00
Purple	775	774	0.0	0.0	0.0	0.0	0.00
Santa Rosa	150	124	0.0	5.0	5.0	5.0	3.75

[1] Disease index: 0 = 0, 1 = 1-20, 2 = 21-40, 3 = 41-60, 4 = 61-80, and 5 = 81-100 percent of tree, fruit, and leaves infected with black rot, bacterial canker, bacterial fruit spot, and bacterial leaf spot.

commercial markets, Table 4. Maturity date is approximately 3-4 days after 'Bruce.' The plant is self-fruitful, flowers profusely, and sets a heavy crop annually.

Bruce 12-4 has produced high yields each year in experimental and grower plantings, even in years when other plums have suffered frost and cold injury, Table 5. Although no data were recorded on cold damage to dormant buds, no evidence of cold injury was observed in grower or experimental plantings.

Progeny tests show Bruce 12-4 to be an excellent seedling for breeding purposes, one that transmits its desirable characters in high frequency.

AVAILABILITY

Budwood may be secured from Joseph D. Norton, Department of Horticulture, Auburn University, Auburn, Alabama 36830.

TABLE 3. FRUIT CHARACTERISTICS OF PLUM VARIETIES

Variety	Fruit set	Flesh color	Skin color	Fruit diameter	Shape	Flavor	Firmness	Stone freeness	Texture	Soluble solids
				In.						*Pct.*
Bruce	5[1]	orange to red	orange to red	1¾-2	5[1]	3[1]	3[1]	cling	3[1]	9.4
Bruce 12-4	5	light orange	vivid red	1¾-2	5	3	3	cling	3	9.7
Crimson	5	crimson red	crimson red	1½-1¾	5	5	5	cling	5	16.3
Methley	5	dark red	dark red to purple	1-1¼	5	5	3	cling	5	18.5
Homeside	5	cream	orange to light red	2¼-2½	5	5	4	cling	5	18.8
Ozark Premier	5	cream	red to purple	2-2¼	5	5	4	free	5	15.7
Purple	5	cream	dark red to purple	1¾-2	5	5	5	semi cling	4	14.8
Santa Rosa	4	red	dark red to purple	1¼-1½	5	5	5	cling	5	16.7

[1] Rating index: 5 = excellent, 4 = good, 3 = fair, 2 = poor, and 1 = very poor.

TABLE 4. PERCENT MARKETABLE PLUM FRUIT AFTER DIFFERENT STORAGE PERIODS AT 35°F.

Variety	Marketable fruit by weeks of storage				
	3	6	9	12	14
	Pct.	*Pct.*	*Pct.*	*Pct.*	*Pct.*
Bruce	20	5	0	0	0
Bruce 12-4	25	10	0	0	0
Crimson	100	90	65	30	15
Methley	95	70	20	0	0
Homeside	90	65	15	0	0
Ozark Premier	90	65	15	0	0
Purple	100	85	55	25	8
Santa Rosa	100	80	45	20	5

TABLE 5. BLOOM HARVEST DATES AND YIELD OF PLUM VARIETIES, TWO LOCATIONS

Variety	Auburn			Clanton		
	Bloom date	Harvest date	Yield[1] index	Bloom date	Harvest date	Yield index
Bruce[2]	3-20	6-29	2	3-17	7-3	3
Bruce 12-4	3-21	7-1	5	3-18	7-6	5
Crimson	3-22	7-14	5	3-19	7-18	5
Homeside	3-20	7-5	5	3-10	7-10	5
Methley[3]	3-22	6-10	3	3-20	6-14	3
Ozark Premier	3-20	7-10	4	3-18	7-15	4
Purple	3-24	7-20	5	3-23	7-22	5
Santa Rosa[4]	3-24	7-5	3	3-22	7-8	3

[1] Yield index: 0 = none, 1 = very low, 2 = low, 3 = fair, 4 = good, and 5 = excellent.
[2] Trees short lived due to ring spot virus.
[3] Trees short lived due to black knot and bacterial canker.
[4] Trees short lived due to bacterial canker.

ACKNOWLEDGMENTS

The author gratefully acknowledges the essential assistance of H. M. Bryce, Main Station, Auburn, and C. C. Carlton and K. C. Short, Chilton Area Horticulture Substation, Clanton, in evaluation and propagation of material.

Valuable assistance was rendered by J. E. Barrett and H. F. Yates (retired), Gulf Coast Substation, Fairhope; M. H. Hollingsworth, North Alabama Horticulture Substation, Cullman; E. L. Mayton (retired), W. A. Griffey, and H. E. Burgess, Piedmont Substation, Camp Hill.

The assistance of growers in conducting commercial trials with this line is deeply appreciated.

Alabama's Agricultural Experiment Station System
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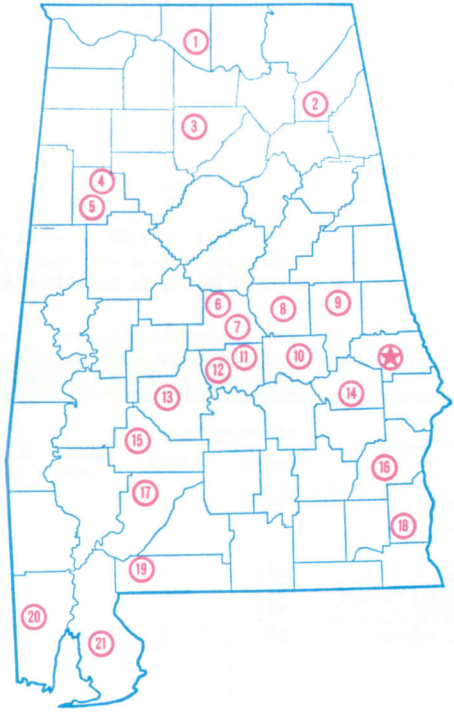
With an agricultural research unit in every major soil area, Auburn University serves the needs of field crop, livestock, forestry, and horticultural producers in each region in Alabama. Every citizen of the State has a stake in this research program, since any advantage from new and more economical ways of producing and handling farm products directly benefits the consuming public.



Research Unit Identification

★ Main Agricultural Experiment Station, Auburn.

1. Tennessee Valley Substation, Belle Mina.
2. Sand Mountain Substation, Crossville.
3. North Alabama Horticulture Substation, Cullman.
4. Upper Coastal Plain Substation, Winfield.
5. Forestry Unit, Fayette County.
6. Thorsby Foundation Seed Stocks Farm, Thorsby.
7. Chilton Area Horticulture Substation, Clanton.
8. Forestry Unit, Coosa County.
9. Piedmont Substation, Camp Hill.
10. Plant Breeding Unit, Tallassee.
11. Forestry Unit, Autauga County.
12. Prattville Experiment Field, Prattville.
13. Black Belt Substation, Marion Junction.
14. Tuskegee Experiment Field, Tuskegee.
15. Lower Coastal Plain Substation, Camden.
16. Forestry Unit, Barbour County.
17. Monroeville Experiment Field, Monroeville.
18. Wiregrass Substation, Headland.
19. Brewton Experiment Field, Brewton.
20. Ornamental Horticulture Field Station, Spring Hill.
21. Gulf Coast Substation, Fairhope.