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3 NEW CHINESE CHESTNUTS

AU-Cropper, AU-Leader, and AU-Homestead – Their History and Production

AGRICULTURAL EXPERIMENT STATION
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AUBURN, ALABAMA

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THREE NEW CHINESE CHESTNUTS: AU-CROPPER, AU-LEADER, and AU-HOMESTEAD—THEIR HISTORY and PRODUCTION

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INTRODUCTION

THE AMERICAN CHESTNUT, *Castanea dentata* (Marsh) Borkh. was the most valuable species in the mixed hardwood forests of the Eastern United States about 75 years ago (*3*). American chestnut trees were fast growing and tall, often attaining heights of 100 feet (*1,7*). The decay-resistant wood was used extensively for construction, utility poles, railroad ties, fence posts, and rail fences. The excellent quality nuts were in abundant supply for man and wildlife each fall.

Then, in approximately 30 years, almost all of these chestnut trees were destroyed by a blight caused by the fungus, *Endothia parasitica* Murr., discovered in 1904 in the Zoological Garden of New York City (*5*). It apparently came into this country on Asiatic nursery stock about 1890. The disease spread rapidly throughout the natural range of the American chestnut. In areas where the American chestnut was once abundant, only a few persistent sprouts from the old stumps remain (*5*). The sprouts occasionally reach a trunk diameter of 6 to 8 inches and produce a few nuts before being killed back to the ground by the bark disease.

The Chinese chestnut, *(Castanea mollissima)* Blume was introduced into the United States in 1907 by the United States Department of Agriculture (*2*) with small plantings initially made over a wide area. Its resistance to the chestnut blight was responsible for the interest in planting the Chinese chestnut.

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Progress has been made in breeding and selection for improved varieties, and this appears to offer the greatest opportunity for further improvement of this crop *(3)*.

The Chinese chestnut is resistant to blight and the best seedlings and varieties bear abundant crops annually. Nuts of the better selections are excellent in quality. Annual yields of 50 to 70 pounds of nuts per tree, from 10 to 12 year old trees, have been reported *(3)*. Yields greater than 130 lb. per tree have been obtained from mature Chinese chestnut trees at Auburn *(7)*. At present day prices, a gross income of $1,320 to $2,850 per acre should be received for an orchard in full production based on data of Davidson and Reed *(4)*. The tree grows well throughout the southern part of the natural range of the American chestnut and southward to the Gulf Coast *(6)*.

IMPROVEMENT OF CHINESE CHESTNUT AT AUBURN UNIVERSITY

A planting of Chinese chestnuts has been growing at the Auburn University Agricultural Experiment Station since 1935 with attention being given to seedling evaluation, propagation, and utilization. The first planting was established at the United States Department of Agriculture Hillculture Farm under the supervision of J.C. Moore. The Hillculture Farm became the Mainstation Horticulture Farm when expansion of the University required this relocation.

Three blight resistant seedlings selected for nut appearance, size, and quality have been released. They are the product of controlled mass pollination and selection from two generations of approximately 2,000 seedlings.

TABLE 1. YIELD AND NUT SIZE OF CHINESE CHESTNUTS, AUBURN, ALABAMA, 1967-1975[1]

Cultivar	Date		Nut size	Yield by years						
	Seed planted	Top worked		1967	1968	1969	1970	1971	1974	1975
			No./Lb.	*Lb.*	*Lb.*	*Lb.*	*Lb.*	*Lb.*	*Lb.*	*Lb.*
Black Beauty ..	1935	—	41	—	112.9	55.5	—	—	—	—
AU-Cropper ...	1935	—	38	107.0	70.6	89.3	71.6	130.9	79.4	132.0
AU-Cropper ...	1954	1965	41	—	—	39.0	45.3	60.6	65.2	88.2
AU-Leader[2] ...	1954	—	35	—	—	19.3	25.9	47.5	36.1	48.0
AU-Leader	1954	1967	34	—	—	—	2.8	27.0	25.9	46.8
AU-Homestead	1954	—	39	42.5	50.4	71.0	62.5	88.3	65.3	98.0
AU-Homestead	1954	1965	41	8.4	10.1	11.3	8.9	25.6	24.5	25.3

[1]Records are on single trees. Maintenance has been limited to occasional mowing. Nuts removed by squirrels and individuals not recorded.

[2]Original tree of AU-Leader was top worked to another seedling by mistake. Therefore, a delay in production resulted.

AU-Cropper was selected and evaluated as seedling 35-A-4-4. It consistently produces high yields of excellent quality nuts (table 1). The nuts are equal in size to commercial market chestnuts; the number per pound is 38 (table 1). Color of the nuts is dark chocolate brown (grayish brown 7.5 YR 3/2)[1] overlain with thin gray pubescence which is more prominent near the apex (figure 1). They are glossy and attractive. Two to three nuts are present in a medium large burr. Nuts separate readily from the burr upon maturity and opening of the burr (table 2).

AU-Leader was selected and evaluated as seedling 54-13. It also produces high yields of excellent quality nuts. The nuts of AU-Leader are larger than those of AU-Cropper and AU-Homestead (table 1). The number of nuts per pound of AU-

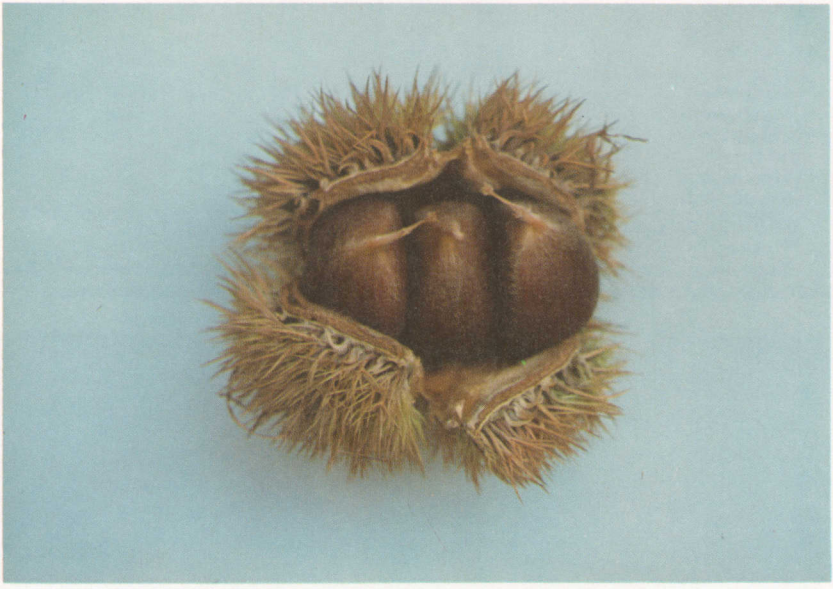

FIG. 1. AU-Cropper (Liang Chang Li).

Leader is 35. Nut color is dark chocolate brown (grayish brown 7.5 YR 3/2) overlain with thin grayish brown pubescence which is more prominent near the apex (figure 2). They are glossy and attractive. Two to 3 large nuts are held in an attractive medium size burr. Nuts separate readily from the burr upon maturity (table 2).

AU-Homestead was selected and evaluated as seedling 54-26. It also produces high yields of excellent quality nuts.

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

However, the nuts mature over a longer period of time than AU-Cropper and AU-Leader. This longer period of maturity would be desirable for the homeowner. The nuts are equal in size to commercial chestnuts; the number per pound is 39 (table 1). The nut color is dark, chocolate brown (moderate

TABLE 2. HARVEST DATES, NUT UNIFORMITY, AND BURR OPENING OF CHINESE CHESTNUTS, AUBURN, ALABAMA

Cultivar	Harvest dates					Rating[1]	Nut uniformity[2]	Burr opening and nut shed[3]
	1967	1968	1969	1970	1971			
Black Beauty (original)	10/1	10/8	10/17	—	—	E	G	1
Black Beauty (topworked)	—	10/12-10/20	10/15	—	—	E	G	1
AU-Cropper (original)	10/14	10/8	10/17-10/24	9/28-10/2	9/16-9/27	M	F	1
AU-Cropper (topworked)	—	—	10/15-10/17	9/24-10/2	9/16-9/30	M	F	1
AU-Leader (original)	—	—	10/15-10/23	9/24-10/2	9/17-9/27	M	G	1
AU-Leader (topworked)	—	—	—	9/24	9/17-9/27	M	G	1
AU-Homestead (original)	10/1-10/12	10/4	10/17-10/23	9/24-10/2	9/17-10/4	L	G	2
AU-Homestead (topworked)	10/12	10/30	10/23	9/25-10/2	9/20-10/5	L	G	2

[1]Maturity date: E = early; M = midseason; and L = late.
[2]Uniformity: G = good; F = fair; and P = poor.
[3]Burr opening and nut shed: 1 = excellent, burr opens well and nuts shed well; 2 = fair, burr opens fairly well; and 3 = poor, many burrs drop without opening.

FIG. 2. AU-Leader (Ding How Li).

brown 5YR 3/3) overlain with a grayish pubescence which turns white near the apex (figure 3). The nut is darker and more glossy than AU-Cropper and AU-Leader. The large burr contains two to three nuts with fair separation of the nuts from the burr (table 2).

FIG. 3. AU-Homestead (Chaung Hwa).

AVAILABILITY OF TREES

Trees of AU-Cropper, AU-Leader, and AU-Homestead should be available from nurseries for planting in the winter of 1980-1981.

A limited quantity of wood for propagation may be secured from J.D. Norton, Department of Horticulture, Auburn University, Auburn, AL 36830.

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