

UNITED STATES DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE
ELSBERRY, MISSOURI

NOTICE OF RELEASE OF SUN HARVEST GERMPLASM AMERICAN HAZELNUT

The Natural Resources Conservation Service (NRCS), U.S. Department of Agriculture announces the release of a selected class of American Hazelnut (*Corylus americana*, Walt.) for the Elsberry, Missouri Plant Materials Center (PMC) three state service area consisting of Iowa, Missouri, and Illinois.

As a selected class release, this plant will be referred to as Sun Harvest Germplasm. It has been assigned the NRCS accession number 9083247. This alternative release procedure is justified because there is a lack of available selections of American hazelnut, specifically for the three state service area.

Collection Site Information: Sun Harvest Germplasm (9083247) is comprised of six different collections from Missouri and Illinois counties. Four collections originated from the Illinois counties from Coles (9057188 and 9068528), Adams (9068562), and Iroquois (9057168) and two collections from Chariton County, Missouri (9068573 and 9068574).

Description: The following plant description was prepared using Nesom (2006) and Steyermark (1963). American hazelnut, also known as American filbert, is a native shrub or very small tree that develops a broad, round canopy. It can reach 12-15 feet tall and 15 feet wide, becoming arching and spread by suckering with age, forming colonial thickets. Main stems are straight with spreading and ascending branches. Light brown twigs are slender with numerous stiff, red-glandular hairs. The middle interior canopy will remain dense as new vertical suckers develop. Leaves form on bristly stalks and the bristles are somewhat granular. Leaves are deciduous, alternate, and broadly oval with a heart-shaped or rounded base. They can grow 2-5 inches long and up to 5 inches wide. Flowers are separate with male and female flowers on the same tree. Male flowers are pendulous catkins, 2 -5 inches long, and in clusters of two or three near branch tips, appear in the fall, but do not open until the following spring. Female flowers are enclosed in gray-brown, scaly buds that have red stigmas and styles, which protrude at the tip. The fruit is light brown, 1-2 cm long, slightly wider than long, acorn-like nut enclosed in large, coarsely toothed leaf-like bracts. American hazelnut typically flower from March - May with fruit ripening from July - September. It commonly occurs in dry or moist thickets, woodlands, and borders of woodlands, in valleys and uplands. American hazelnut is very adaptable to moist or dry, reasonably well-drained soils of variable pH and soil quality and occurs in plant hardiness zones 4 to 9 in full sun to partial shade.

Method of Selection: The six collections that make up Sun Harvest Germplasm were selected from a collection of 14 accessions of American hazelnut originating in Illinois and Missouri. They were evaluated on the basis of growth habit, canopy spread, plant height, nut production, and insect/disease resistance at the Elsberry Plant Materials Center from 1995-1998. Sun

Harvest Germplasm was selected on its growth habit and growth potential for increased nut production.

Ecological Considerations and Evaluation: Sun Harvest Germplasm American hazelnut is a selection of naturally occurring germplasm and does not differ significantly in rate of spread and vigor from naturally occurring hazelnut (*Corylus americana*). Sun Harvest Germplasm American hazelnut was “O.K. to release” based on criteria in the “Worksheet for Conducting an Environmental Evaluation of NCRS Plant Releases”.

Anticipated Conservation Use: Sun Harvest Germplasm American hazelnut provides excellent food and wildlife habitat, and can be used as a windbreak. It can also be incorporated in an agroforestry system due to its nut production value.

Anticipated Area of Adaptation: Although there has been no formal field plantings to test the full range of adaptation, it is anticipated that Sun Harvest Germplasm American hazelnut perform adequately throughout the three state service area of the Elsberry Plant Materials Center (Iowa, Illinois, and Missouri). All collections that make up Sun Harvest Germplasm American hazelnut were collected from northern and central Illinois and central Missouri.

Availability of Plant Materials: G1 material is being produced in limited supply by the Elsberry Plant Materials Center. For information contact USDA, NRCS, Elsberry Plant Materials Center, 2803 N. Hwy 79, Elsberry, Missouri 63343 (573 898-2012).

References:

Steyermark, J. 1963. Flora of Missouri. Iowa State University Press. Ames, IA. pp. 523-525

Nesom, G. 2006. Plant Guide American Hazelnut. USDA NRCS National Plant Data Center and the Biota of North America Program. Formerly BONAP, North Carolina Botanical Garden, University of North Carolina, Chapel Hill, North Carolina.

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Signatures for release of:

Sun Harvest Germplasm American Hazelnut (*Corylus americana*, Walt.)

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Release Documentation for Accession 9083247 Sun Harvest Germplasm American Hazelnut, USDA-NRCS, Elsberry Plant Materials Center - 2007

NRCS field office collections of hazelnut were assembled at the PMC between 1989 and 1992. (Table 1). Thirty-six accessions collected from Illinois and Missouri were stratified and placed in the greenhouse in 1993. Twenty-one accessions germinated and were grown out in two-gallon containers. These accessions were placed in a randomized complete block with eight replications. The planting was established May 3 and 4, 1994, in Field #11E on the PMC. The summer of 1994 had several significant dry spells and considerable time was spent irrigating. Many plants were stressed, lost leaves, and resprouted. Four plants in the evaluation block failed to survive in 1994. The assembly was evaluated from 1995-1998. The following accessions were selected in 1997 as a nut production composite: 9057168 (Iroquois County, Illinois), 9057188 and 9068528 (Coles County, Illinois), 9068562 (Adams County, Illinois), and 9068573 and 9068574 both from Chariton County, Missouri. The selection criteria for these accessions are as follows: growth habit (form), canopy spread, plant height and fruit production and resistance to insect and disease.

A comparison of growth habit of 14 accessions is presented in Table 2. There were differences in growth form between accessions but the magnitude was relatively small among the accessions. When averaged over years, trees that comprised the Sun Harvest germplasm composite were uniform in growth habit, which was defined as being near rounded in its plant architecture. Canopy spread and plant height of the 14 accessions is presented in Tables 3 and 4. Accessions selected for Sun Harvest germplasm were similar in height but varied in canopy spread.

Emphasis on fruit production and resistance to insects and disease was an important characteristic during the evaluation process. Fruit production and disease and insect resistance were similar in all accessions, but the ones that made up the Sun Harvest germplasm rated average to fair nut production with satisfactory disease and insect resistance. (Table 5)

Based on the evaluation criteria, the six accessions were selected for a polycross nursery in 2003 and assigned accession 9083247 and will be recognize as Sun Harvest germplasm.

Table 1. Field collections of American Hazelnut and origin

Accession Number	State or Origin	City or County
9057081	Illinois	Coles
9057082	Illinois	Coles
9057087	Illinois	Coles
9057119	Illinois	Whiteside
9057120	Illinois	Carroll
9057167	Illinois	Will
9057168	Illinois	Iroquois
9057169	Illinois	Iroquois
9057184	Illinois	Clark
9057186	Illinois	Coles
9057188	Illinois	Coles
9057192	Illinois	Montgomery
9057195	Illinois	Morgan
9068505	Illinois	Coles
9068507	Illinois	Cumberland
9068508	Illinois	Mercer
9068509	Illinois	Ogle
9068510	Illinois	Iroquois
9068511	Illinois	Effingham
9068512	Illinois	Clay
9068513	Illinois	Pike
9068525	Illinois	Cumberland
9068526	Illinois	Coles
9068527	Illinois	Moultrie
9068528	Illinois	Coles
9068529	Illinois	Vermilion
9068562	Illinois	Adams
9068565	Illinois	Jo Daviess
9068585	Illinois	DeWitt
9068586	Illinois	Vermilion
9068570	Missouri	Lincoln
9068573	Missouri	Chariton
9068574	Missouri	Chariton
9068575	Illinois	Johnson

Table 2. Comparison of growth habit of 14 accessions of American hazelnut (*Corylus americana*, Walt.) from 1995-1998 and four year average at the USDA-NCRS Elsberry, Missouri Plant Materials Center.

Accession ^{1/}	1995	1996	1997	1998	Average
9057188	4.25 ^{2/} ab ^{3/}	4.25 abcd	3.75 abc	4.25 abcd	4.13 abc
9068528	4.13 ab	4.38 abcd	4.38 abc	4.25 abcd	4.28 abc
9068562	3.75 b	4.88 abc	5.25 abc	3.75 bcd	4.41 abc
9068573	4.50 ab	4.25 abcd	5.00 abc	4.13 abcd	4.47 abc
9068574	6.00 a	5.25 ab	5.63 a	5.00 abc	5.47 a
9057168	5.75 ab	5.36 ab	5.75 a	5.25 ab	5.47 a
9068507	4.13 ab	3.25 cd	3.38 c	3.88 abcd	3.28 c
9068558	5.13 ab	3.88 bcd	3.50 bc	2.88 d	3.84 bc
9068586	4.75 ab	3.50 cd	4.00 abc	3.13 cd	3.84 bc
9068565	5.13 ab	4.75 abcd	5.13 abc	3.88 abcd	4.72 abc
9068525	5.63 ab	4.88 abc	4.88 abc	4.63 abcd	5.00 ab
9068508	5.63 ab	5.50 a	5.50 ab	5.00 abc	5.41 ab
9057169	5.75 ab	4.75 abcd	5.38 abc	5.88 a	5.44 a
9068510	6.13a	5.00 abc	5.50 ab	5.25 ab	5.47 a
Mean	5.05	4.56	4.79	4.37	4.66

1/ accessions highlighted were selected for polycross nursery and assigned accession number 9083247.

2/ numerical rating where 1 = rounded growth habit and 9 = least rounded growth habit.

3/ means in year and average columns followed by the same letter are not significantly different at the P<0.05.

Table 3. Comparison of canopy spread of 14 accessions of American hazelnut (*Corylus americana*, Walt.) from 1995-1998 at the USDA-NRCS Elsberry, Missouri Plant Materials Center.

Accession ^{1/}	1995	1996	1997	1998
	-----measured in feet-----			
9057188	1.09 ^{2/} a ^{3/}	2.80 a	4.26 a	6.05 a
9068573	0.83 ab	2.41 ab	3.88 ab	5.66 ab
9068562	0.68 abcd	2.16 abc	3.70 abc	5.04 abc
9057168	0.71 abc	2.04 abc	3.01 bcd	4.48 bcde
9068574	0.78 ab	1.99 abc	3.35 abcd	3.70 cdef
9068528	0.43 abcd	1.88 bcd	2.66 cd	3.56 cdef
9068508	0.65 abcd	2.21 abc	3.08 bcd	4.94 abcd
9057169	0.58 abcd	2.06 abc	4.26 a	4.31 bcde
9068525	0.34 abcd	1.70 bcd	3.00 bcd	3.95 cdef
9068510	0.61 abcd	1.78 bcd	3.23 abcd	3.83 cdef
9068558	0.56 abcd	1.65 bcd	2.55 cde	3.45 def
9068565	0.58 abcd	1.54 cd	2.26 de	3.28 ef
9068586	0.50 abcd	1.79 bcd	2.61 cd	3.21 ef
9068507	0.43 abcd	1.08 d	1.41 e	2.45 f
Mean	0.63	1.94	3.09	4.14

1/ accessions highlighted were selected for polycross nursery and assigned accession number 9083247.

2/ canopy spread was determined by measuring (in feet) the average length of the canopy of plants in each replication

3/ means in columns followed by the same letter are not significantly different at the P<0.05.

Table 4. Comparison of plant height of 14 accessions of American hazelnut (*Corylus americana*, Walt.) from 1995-1998 at the USDA-NRCS Elsberry, Missouri Plant Materials Center.

Accession ^{1/}	1995	1996	1997	1998
	-----measured in feet-----			
9057188	2.55 ^{2/} ab ^{3/}	3.35 a	4.20 a	5.46 a
9068573	2.74 a	3.06 ab	3.71 abc	5.34 a
9068562	2.06 abc	2.66 abc	3.83 ab	4.94 ab
9068574	1.76 cde	2.65 abc	3.31 abcd	4.45 abc
9057168	1.51 cde	2.26 bcd	3.18 abcd	4.21 abcd
9068528	1.21 de	2.08 cd	3.10 abcd	3.75 bcde
9057169	1.55 cde	2.35 bcd	3.49 abcd	4.40 abc
9068510	1.43 cde	2.11 cd	3.21 abcd	4.29 abcd
9068508	1.86 bcd	2.43 abcd	3.38 abcd	4.00 abcd
9068525	1.09 e	1.75 cd	2.86 bcde	3.77 bcde
9068558	1.59 cde	1.81 cd	2.56 cde	3.68 bcde
9068586	1.41 cde	2.18 bcd	2.96 bcde	3.17 cde
9068565	1.95 bcd	2.01 cd	2.46 de	2.84 de
9068507	1.30 de	1.63 d	1.76 e	2.33 e
Mean	1.72	2.31	3.14	4.05

1/ accessions highlighted were selected for polycross nursery and assigned accession number 9083247.

2/ plant height was determined by measuring (in feet) the average height of the plants in each replication

3/ means in columns followed by the same letter are not significantly different at the P<0.05.

Table 5. Comparison of fruit production and disease and insect resistance of 14 accessions of American hazelnut (*Corylus americana*, Walt.) for 1997 at the USDA-NRCS Elsberry, Missouri Plant Materials Center.

Accession ^{1/}	Fruit ^{2/} Production	Accession ^{1/}	Disease and Insect ^{3/}
9068528	5.74 ^{4/} a	9057188	3.00 ^{4/} a
9057188	5.75 a	9068573	3.18 a
9068573	6.31 a	9068528	3.19 a
9068562	6.44 a	9057168	3.25 a
9057168	7.19 a	9068562	3.31 a
9068574	8.19 a	9068574	3.68 a
9068565	5.75 a	9068525	3.11 a
9068508	5.75 a	9057169	3.13 a
9068586	5.97 a	9068558	3.28 a
9068558	6.27 a	9068586	3.35 a
9057169	6.45 a	9068508	3.37 a
9068525	7.52 a	9068510	3.50 a
9068510	7.68 a	9068565	4.06 a
9068507	7.88 a	9068507	4.08 a
Mean	6.64	Mean	3.39

1/ accessions highlighted were selected for polycross nursery and assigned accession number 9083247.

2/ fruit production numerical rating where 1 = heavy producer; 3= good producer;

5 = average producer; 7= fair producer; 9 = poor producer and 10 = none

3/ disease and insect damage where 1 = no damage; 3 = slight damage; 5 moderate damage;

7 = severe damage.

4/ means in fruit production and disease and insect column followed by the same letters are not significantly different at P<0.05.