United States Department of Agriculture

NRCS

Natural Resources Conservation Service
P.O. Box 2890
Washington, D.C. 20013

COPY

September 18, 2009

SUBJECT: ECS-Plant Materials Center – Release Notice FILE CODE: 190-18

TO: Steve Parr
Upper Colorado Environmental Plant Center
5538 RBC #4
Meeker, CO 81641

Attached is a signed copy of the plant materials Release Notice and Environmental Evaluation for **Colorow Germplasm black chokecherry (*Prunus virginiana* spp. *melanocarpa*)**.

I have retained a copy for files at Headquarters and have also forwarded a copy to the National Plant Materials Center in Beltsville for the archives. Please forward a copy of the final signed release notice to any cooperators.

Please ensure that you update your POMS record for this release as well as remind the Colorado State Office to record the new release in PRS before September 30, 2009.

JOHN M. ENGLERT
National Program Leader, Plant Materials
Ecological Sciences Division

Enclosures

cc: (w/o enclosures):
Mike Hubbs, Director, Ecological Sciences Division, NRCS, Washington, D.C.
Allen Green, State Conservationist, NRCS, Lakewood, CO
Frank Riggle, State Resource Conservationist, NRCS, Lakewood, CO
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cc: (w/ enclosures):
Jeremy West, Manager, National PMC, Beltsville, MD

UPPER COLORADO ENVIRONMENTAL PLANT CENTER
MEEKER, COLORADO

and

UNITED STATES DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE
LAKEWOOD, COLORADO

and

COLORADO STATE AGRICULTURAL EXPERIMENT STATION
FORT COLLINS, COLORADO

NOTICE OF RELEASE OF COLOROW GERMPLASM BLACK CHOKECHERRY

Upper Colorado Environmental Plant Center (UCEPC), the Natural Resources Conservation Service, U.S. Department of Agriculture, and Colorado State Agricultural Experiment Station announce the naming and release of Colorow Germplasm black chokecherry (*Prunus virginiana* L. spp. *melanocarpa* A. Nelson). Colorow Germplasm black chokecherry has been assigned the NRCS Accession number 9024060 and is released as a selected class of certified seed.

In the plantings where tested, Colorow Germplasm has as good or better survival and vigor as the other accessions. It has been a good producer of fruit at UCEPC where 300 pounds of fruit were collected in 1998 from 20 plants, averaging just over 15 pounds per plant. At this time, there are no NRCS releases of this plant. Black chokecherry has many conservation uses including shelterbelts, windbreaks, soil stabilization, food for wildlife and pollinators, and shelter, cover, and nesting for wildlife.

This alternative release is justified because there is no release of this sub-species. In addition, the site of the seed source is near the proximity of the Roan Plateau and the Piceance Basin of western Colorado and eastern Utah. This area, along with southern Wyoming, is undergoing substantial disturbance from oil and gas development. Seed increase and plant production of specific ecotypes, especially for use in the central Rocky Mountains, is needed for increased opportunities for site-specific and site-adapted products for conservation applications.

Collection Site Information: Accession 9024060 was collected on September 3, 1975, by Curt and Pat Carnahan, at an elevation of 6200 feet in Rio Blanco County at the Meeker Junior High School, currently the Administration Building, Meeker, Colorado. The collection was obtained from Township 1N, Range 94W, Section 23 in the town of Meeker block 21, lots 1 – 12. Approximations for the site include 16 inches of annual precipitation and a 90 day frost free growing season.

Description: Colorow Germplasm black chokecherry is a native colonizing, horizontal branching, rhizomatous, perennial shrub and/or small tree. Its main stem system may be single or may have multiple stems branching at the base (USDA Plants Database 2009). Twigs are

slender with prominent red to white lenticels; the bark is greenish at first and later becomes reddish-brown. As the shrub matures the bark becomes grey to black. The root system consists of shallow rhizomes which contribute to its sprouting and rapid colonization. Leaves are alternate, simple, glabrous and elliptic ranging from 2 - 4 inches long and 1 - 2 inches wide with serrate margins. At the apex of the leaf petiole, two glands 1 - 2 centimeters long are visible. The flowers are showy white aromatic racemes with five petals. The corolla is one-half inch in diameter. Mature fruit, approximately one-third inch in diameter, are fleshy drupes that are dark red to black and possess an acidulous taste (Stubbendick 2003). The fleshy outer layer of the fruit is nontoxic. However, poisoning and death have occurred in children who have consumed large amounts of berries without removing the stones/seed (Kingsbury 1964). The stone possesses high levels of hydrogen cyanide (HCN) or prussic acid. Seed should be collected in mid-August to mid-September. When stored properly, Colorow Germplasm seed can stay viable for 10 years or more. Cold stratification at 5°C (41°F) for 120 to 160 days is recommended to help insure seed germination.

Colorow Germplasm is a large vigorous chokecherry, with mature plants reaching an average height of 12 feet and about 13.5 feet wide. Colorow Germplasm begins flowering in May and the fruit is ripe in mid to late August (UCEPC Annual Technical Reports 1991-1998). Black chokecherry can be found throughout Canada, south to Georgia, west to New Mexico, and California at elevations ranging from 500 – 10,000 feet (Welch).

Method of Breeding and Selection: Colorow Germplasm has been studied at UCEPC for 31 years. In that time ten studies involving Colorow Germplasm have been conducted; six studies on site at UCEPC and four off-site studies. These studies included evaluation of black chokecherry tublings, a germination study, direct seeding methods, and off-center performance studies. In chronological order, the studies have been summarized to review data collected from over the 31 years.

In 1977, seven accessions of chokecherries were planted in the UCEPC orchard for an initial evaluation. The woody tublings were evaluated from 1977 through 1988 (11 years). Accession 9024060 (Colorow Germplasm) had the best performance out of the seven chokecherry accessions. Performance was based on survival and overall plant vigor. The 1988 evaluation listed accession 9024060 with 100% survival, excellent vigor, heavy seed production, and very light wildlife use in regards to browsing (Table 1). However, wildlife readily used the shrub with regards to the berries and flowers. Berries were readily consumed by birds and some mammals including bears, raccoons and coyotes. Flowers provided an excellent source of nectar for the pollinators in the area. It was then determined to isolate the accession for further evaluation.

Table 1. Table of *Prunus virginiana* Evaluation Information from 1988 Evaluation.

Species	Accession Number	No. Plants	Survival No.	Vigor	Seed Production	Wildlife Use
Prunus virginiana	9024058	7	7	3	M	L
Prunus virginiana	9024059	7	7	3	M	L
Prunus virginiana	9030912	6	6	3	H	L
Prunus virginiana	**9024060**	**6**	**6**	**2**	**H**	**VL**
Prunus virginiana	9024061	6	5	4	L	L
Prunus virginiana	9024062	6	6	3	M	VL
Prunus virginiana	9024064	6	3	3	H	VL

Vigor: 1 excellent----9 very poor
Wildlife use: L low----VL very low
Seed production: L low, M medium, H heavy

On May 24, 1991, accession 9024060 (Colorow Germplasm) was planted in a shrub isolation planting at UCEPC. Twenty-one sprigs were hand dug from the original planting of tublings in the UCEPC orchard and planted on 10-foot spacings. June 16, 1992, ten plants were re-planted in the isolation planting. Evaluations in 1993 showed 20 plants of the 21 sprigs planted were alive and doing well.

Several off site plantings have involved Colorow Germplasm. In 1976, a test plot was planted on Colorado Yampa Coal Company property with grasses, forbs, and shrubs. The site was planted with woody tublings in 1977. Colorow Germplasm and one other accession of chokecherry were planted on the site. Ten plants of each accession were planted on three-foot-row spacings with four feet between each plant. During the 1979 evaluation it was observed that both black chokecherry accessions had two plants alive and by 1980 both accessions of chokecherries were dead. It was determined that the small chokecherry shrubs could not compete with the thick overstory. The aggressive canopy of alfalfa, wheatgrasses, bromes and orchard grasses was over three feet tall and did not allow the small chokecherries to survive.

A 17 year study was conducted in cooperation with Colowyo Coal Mine Company, and on June 21, 1977, UCEPC planted a woody shrub trial on Colowyo property. Two accessions, 10 tublings of each, Colorow Germplasm and accession 9024059 were planted in the trial. Rows were four feet wide and each tubling was planted four feet apart. The site received 14 – 16 inches of precipitation annually and was at an elevation of 7200 feet on a north facing slope. In the 1994 final report, accession 9024060 (Colorow Germplasm) was judged superior among the two chokecherry entries due to its higher survival rate with adequate vigor (Table 2).

Table 2. Seventeen Year (1977-1994) Survival and Plant Performance Trial at Colowyo Coal Mine, Craig, Colorado.

EPC Number/accession for black chokecherry	Number Planted	Survival	Vigor	Height (cm)	Width (cm)	Seed
EPC 174-9024059	10	50%	4	130	100	H
EPC 229-9024060	10	60%	5	95	75	L

Vigor: 1 excellent---9 very poor
Seed: H heavy---L low

On June 6, 1978, in Silverton, Colorado, at tailing pond number two, owned by Standard Metals, a test plot was planted with 92 shrubs. Silverton is located at an elevation of 9700 feet and receives 24 inches of precipitation annually. However, since the location is at such a high elevation, evapotranspiration during certain times of the year is greater than precipitation received. It was documented that on June 21, 1978, chokecherry 9024060 (Colorow Germplasm) had no living tublings; in fact most plants on the site did not make it to the second growing season. Drought conditions at the site, tubling shrub size or damage to the tubling root system may have caused the quick mortality of the woody shrubs.

After several studies in Colorado, it was decided that testing of accession 9024060 (Colorow Germplasm) needed to be tested in other locations of UCEPC service areas. On May 19, 1987, fifteen accessions of various shrubs and trees were planted at Soda Lake, Pinedale, Wyoming. Each accession of shrub or tree had five plants planted in the plot. Three collections of *Prunus virginiana* and two *Prunus* sp. were tested, one *Prunus virginiana* was accession 9024060 (Colorow Germplasm). On June 14, 1994, the shrub plot was evaluated and accession 9024060 had the best survival and vigor among other chokecherries in the planting (Table 3). On June 25, 1996, the shrub and tree component of the field planting went through its final evaluation (Table 4). In the evaluation it was determined that accession 9024060 and 9039220 had 80% survival after nine years of growth and good to fair overall plant vigor respectively (Holzworth 1996). Although both chokecherry accessions had the same survival in 1996, 9024060 maintained a higher vigor rating. Colorow Germplasm consistently had the highest vigor rating and survival.

Table 3. 1994 Evaluations for the 1987 Woody Species Planting in Pinedale, Wyoming.

Accession number	Species	Number of plants	Number alive	Height (cm)	Width (cm)	Vigor
9024060	*Prunus virginiana*	5	5	17	20	4
9026052	*Prunus virginiana*	5	2	16	13	4
9039220	*Prunus virginiana*	5	4	10	8	5
9005479	*Prunus* sp.	5	0	-	-	-
9029274	*Prunus* sp.	5	3	5	5	6

Vigor: 1 excellent---9 very poor

Table 4. 1996 Evaluations for the 1987 Woody Species Planting in Pinedale, Wyoming.

Accession number	Species	Number of plants	Number alive	Height (cm)	Width (cm)
9024060	*Prunus virginiana*	5	4	21	37
9026052	*Prunus virginiana*	5	1	16	17
9039220	*Prunus virginiana*	5	4	28	23
9005479	*Prunus* sp.	5	0	-	-
9029274	*Prunus* sp.	5	3	18	13

Vigor: 1 excellent---9 very poor

At UCEPC, seven native shrub species were direct-seeded on January 11, 2006. The plots were planted by hand at seeding rates of 30 seeds per plot. Plot sizes were 30-feet long by three-feet wide, with three replications. No evidence of Colorow Germplasm germination was seen in 2006 or 2007, when the project was terminated. A greenhouse trial was conducted concurrently using the same accessions. However, no germination of Colorow Germplasm was observed.

In another attempt to direct seed, UCEPC planted a trial using a hand-pushed belt seeder. Colorow Germplasm along with 15 other native shrubs were planted November 6, 2006, in three replications that were 20-feet by 3-feet wide. On July, 19, 2007, the trial was evaluated for percent plant stand and Colorow Germplasm had only 11% stand.

With several years of seed harvests from accession 9024060 at UCEPC, a study was conducted to see how well different seed lots would germinate using direct seeding. On October 11, 2007, eight different seed lots from accession 9024060 were seeded three different 3 foot by 20 foot long blocks. Seed was planted with a hand-pushed belt seeder at a rate of 18 seeds per linear foot. The study was evaluated on July 30, 2008. Most seed lots with the exception of year 2002 had performed well (Table 5). The seed lot from 2002 had no seed germination. The study proved that Colorow Germplasm seed can be viable for at least ten years.

Table 5. Establishment of Black Chokecherry (Accession 90024060 Colorow Germplasm) from Direct Seeding.

Seed Lot (year) for Colorow	Percent Plant Stand	Plant Height (cm)
2007	45	22
2003	23	11
2002	0	0
2001	38	26
2000	43	18
1999	35	24
1998	11	15
1997	15	18

In addition, UCEPC has collected six years of seed from the isolation plot. High seed production along with survival and vigor were some of the key factors that help selected out accession 9024060 from other chokecherry accessions. On August 25-27, 1998, the first crop of black chokecherry seed was harvested from the isolation planting. The total amount of fresh seed harvested was 300 pounds, resulting in 106 pounds of dried seed (Table 6).

Table 6. Table of Amounts of Cleaned Seed from Isolation Plot, Colorow Germplasm.

Year of Harvest	Amount of Cleaned Seed
1998	106.0 lb
1999	9.0 lb
2000	30.5 lb
2001	21.92 lb
2003	4.80 lb
2007	47.0 lb
2008	36.5 lb

Ecological Considerations and Evaluation: An Environmental Evaluation of Plant Materials Releases was completed using guidelines established by NRCS, over 20 years of production experience at UCEPC, and a general knowledge of the plant specie. The environmental assessment indicated a release of this plant will have low impact on ecosystems and habitats.

Members of the genus *Prunus* are a well known root sprouters because of their extensive rhizomatous root systems. Colorow Germplasm has been observed propagating not just from seed, but from sprouts or suckers. In the 20 years that UCEPC has grown black chokecherry, it has displayed minor aggressive behavior because of rhizomatous roots. Some routine management may be required to control and maintain this plant species in an agronomic, horticultural or home landscaping application, but control practices are financially feasible and practical. No specific management is anticipated in range or large landscape plantings where the species naturally occurs.

Black chokecherry is an important provider of food, shelter, nesting, and browse for wildlife. However, it has been documented that livestock, primarily cattle and sheep, are very susceptible to poisoning when grazing on black chokecherry. Lethal doses occur when an animal ingests 0.25% of their body weight in an hour or less (CBIF 2009). Black chokecherry produces toxic levels of hydrogen cyanide (HCN) or prussic acid in the plant's bark, leaves, stems, and stone/seed pit. HCN is produced enzymatically from cyanogenic glycosides when plant tissue is fragmented during mastication, rumination, and frost damage (Crowder 2003). Leaves of chokecherry are especially toxic in spring and summer, but poisoning is not likely to occur then because the chokecherry is not relished by cattle and sheep when more palatable forage is abundant (Muenscher 1949).

Conservation Use: Black chokecherry is a valuable plant for providing not just food, but shelter, cover, and nesting habitat for wildlife. Its fruit is readily sought out by bear, birds,

rabbits, rodents, and small mammals (Geyer 2008). The young immature plants are desirable to deer, elk, moose, bear, bighorn sheep, and pronghorn during the spring as well as winter months. During the spring months, while in bloom, chokecherry provides an excellent source of nectar for many pollinators such as ants, butterflies, honeybees, flies, and hummingbirds. Chokecherry is used in urban landscaping enhancement plantings, range and mined land reclamation plantings, shelterbelts, and windbreaks. Its extensive root system is beneficial in reducing and controlling soil erosion in rangelands and mine land reclamation. In most windbreaks, chokecherry is a good shrub to be used in the outside rows. Its dense growth makes it ideal for reducing wind near the ground surface (Kansas Forest Service).

The Native American Blackfoot tribes used chokecherry for many medicinal uses. The chokecherry fruit was used for canker sores, sore throats, sore eyes, and diarrhea. The bark of the plant was used for diarrhea as well. Roots from chokecherry were dried, chewed, and placed in wounds to prevent further bleeding. The stems were boiled to make a strong tea to treat high fevers (Stromberg 2001).

Area of Adaptation: This species can be found along streambanks, drainages, gullies, sheltered hill slopes, and canyon bottoms. It is well adapted to soil types that range from Entisols to Mollisols that have soil textures ranging from sandy loams to clays (Welch). It can tolerate moderately acidic (pH 3.5), moderately basic (pH 7.6) and weakly saline soils. However, it cannot tolerate soils that are poorly drained or suffer from prolonged flooding periods. It is well suited in sites that receive 12 to 30 inches of precipitation annually (Wasser 1982). It has been tested in Wyoming's MLRA 43B and in Colorado's MLRA 34. However, further testing should be conducted in Colorado, Utah, and Wyoming. Other Major Land Resource Areas for testing include 48A, 48B, 36, 49, and 47 in Colorado, MLRA 34A in Wyoming and MLRA 47, 48, 34, and 35 in Utah. Generally this species is cold tolerant and winters well, but can tolerate drought conditions and can handle warm temperatures. Black chokecherry can be found at elevations of 4500 – 9000 feet in Colorado (Harrington 1964). Colorow Germplasm has been tested near Pinedale, Wyoming, and Meeker, Silverton, and Craig, Colorado.

Availability of Plant Materials: UCEPC will maintain G1 seed. G1 seed and G2 plants will be available to growers and nurseries. Growers and nurseries may sell G1 seed or G2 plants. No seed beyond G1or plants beyond G2 will be eligible for certification as Colorow Germplasm.

References:

CBIF. 2009. Canadian Poisonous Plants Information Systems. URL:(http://www.cbif.gc.cal) (accessed March 4, 2009). Canadian Biodiversity Information Facility. Canada.

Crowder Wayne, Geyer A. Wayne, Broyles J. Patrick. 2003. Plant Guide, Chokecherry. Manhattan Plant Materials Center. Manhattan, KS.

Geyer A. Wayne, Broyles J. Patrick, Row M. John. 2008. Plant Fact Sheet, Chokecherry. Manhattan Plant Materials Center. Manhattan, KS. Pg 1-3.

Harrington H.D. 1964. Manual of the Plants of Colorado 2nd edition. The Swallow Press Incorporated. Chicago, IL. Pg. 308

Holzworth Larry. 1996. Progress Report Project 08A137 Soda Lake-Pinedale, Wyoming Field Evaluation Planting. Bozeman MT. Unpublished. Bozeman, MT.

Johnson J. Ron. Beck M. Mary, Brandle R. James. 1991. Windbreaks & Wildlife. University of Nebraska-Lincoln. Pg. 7. Lincoln, NB.

Kingsbury M. John.1964. Poisonous Plants of the United States and Canada. Prentice-Hall, Inc. Englewood Cliffs, NJ. Pg. 368

Muenscher C. Walter.1949. Poisonous Plants of the United States. The Macmillan Company. New York, NY. Pg.111

Stromberg Lana. North American Herbology: Traditionally Used Medicinal Plants. 2001. Proceedings of the 10th Annual History of Medicine Days. University of Calgary. Pg. 226.

Stubbendick James. North American Wildland Plants; A Field Guide 6th edition. 2003. Board of Regents of the University of Nebraska. Lincoln, NB. Pg 414 - 415.

Unknown. Choke Cherry *Prunus virginiana.* URL:(www.kansasforests.org/conservation/shrubs/chokecherry.pdf) (accessed August 17, 2009). Kansas Forest Service, Kansas State University. Manhattan, KS.

Upper Colorado Environmental Plant Center. 1991-1998. Annual Technical Reports. Meeker CO. Unpublished. Meeker, CO.

USDA, NRCS. 2009. The PLANTS database. URL:(http://plants.usda.gov) (accessed August 13, 2009). National Plant Data Center. Baton Rouge, LA.

Wasser C.H. 1982. Ecology and Culture of Selected Species Useful in Revegetating Disturbed Lands in the West. U.S. Dept. Int., Fish Wildlife. Serv. FWS/OBS-82/56.347 pp.

Welch L. Bruce. *Prunus virginiana* Chokecherry. URL:(http://www.fs.fed.us/global/iitf/pdf/shrubs/Prunus) (accessed August 13, 2009). Rocky Mountain Research Station, U.S. Department of Agriculture Forest Service. Provo, UT.

Prepared by:

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Signatures for the release of:

Colorow Germplasm black chokecherry, *Prunus virginiana* spp. *melanocarpa*

Allan Jones, President
Upper Colorado Environmental Plant Center
Meeker, Colorado

9-14-2009
Date

Allen Green, State Conservationist, Colorado
USDA Natural Resources Conservation Service
Lakewood, Colorado

9-14-09
Date

Dr. Lee Sommers, Director
Colorado Agricultural Experiment Station
Fort Collins, Colorado

9-09-09
Date

Dr. S. J. Wallner
Colorado Agricultural Experiment Station
Fort Collins, Colorado

9/8/09
Date

for Mike Hubbs
Director, Ecological Sciences Division
United States Department of Agriculture
Natural Resources Conservation Service
Washington, D.C.

National Program Leader - Plant Materials

9/18/09
Date