Cultivating Elderberry as a Cash Crop

RIVER HILLS HARVEST

Wealth to Farmers – Health to Communities

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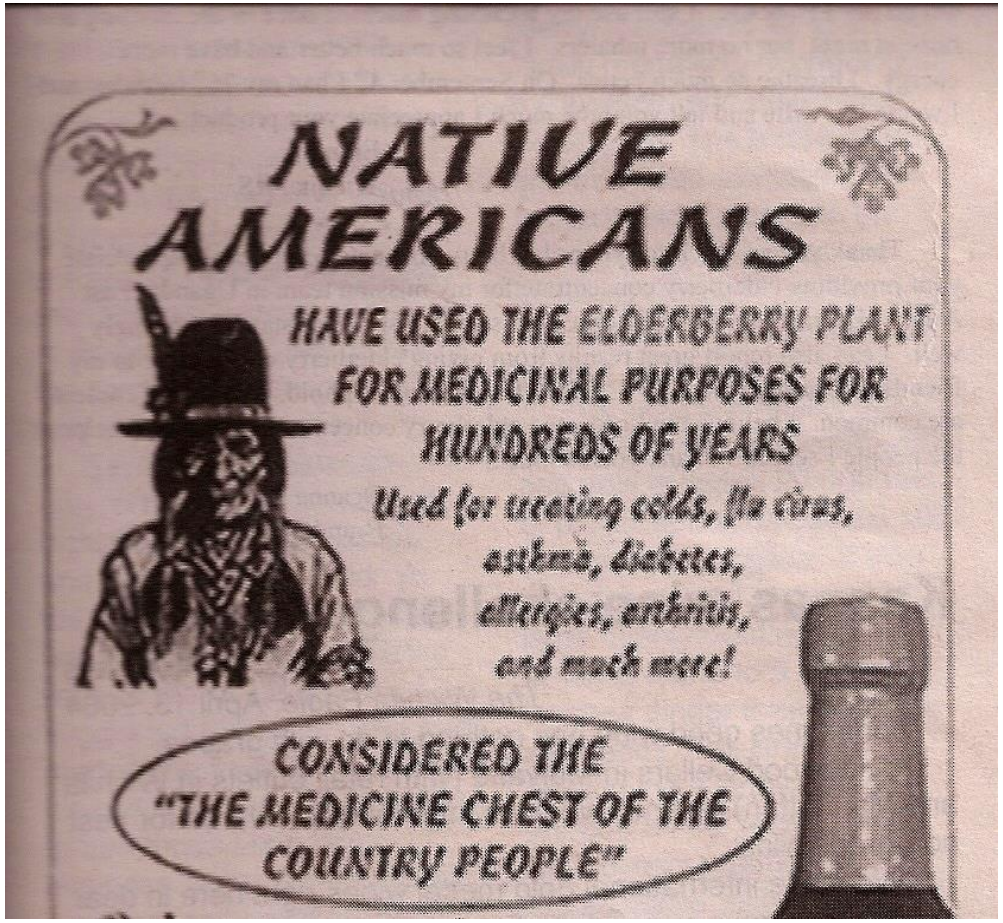
ELDERBERRY: historical & modern uses

- ***Sambucus canadensis* L. (or *Sambucus nigra* L. *ssp. canadensis* (L.) R. Bolli)**
- **Native to much of North America**
- **Medium to large shrub to small tree**

Hippocrates called the Elder Tree his "medicine chest."

If ever the soul of a plant has been fought for, it is elder. An important herb through the ages, it has been described as a whole medicine-chest in one plant. Less used now than formerly, its flowers remain a wonderful fever remedy and delicious in drinks or desserts. The berries work against flu and colds, and help relieve coughs. The leaves, as an ointment, are good for bruises.

Few plants are as steeped in folklore, legend and superstition as the elder. Its hollow stem was said to have been used by Prometheus to bring fire to man from the gods, and the Saxon *aeld* ('fire') may have given elder its name. The same empty stem was a ready-made flute, and the species name *sambucus* was chosen by Linnaeus for a flute made of elder.



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American Elderberry
Latin Name: Sambucas Canadensis

Common Name:
Elderberry, Black Elderberry

Properties
Antioxidant, diaphoretic. diuretic, laxative, immune-boosting, anti-inflammatory

Historical Uses:
Coughs, colds, flu, bacterial infections, viral infections, tonsillitis, lowers cholesterol, improves vision and heart health, immune system booster

Indicated for:
Cancer, HIV, asthma and bronchitis, inflammation of the urinary tract and bladder, nerve disorders, back pain, joint and muscle pain, colds and flu coughs and sore throats

Sources of Antioxidants and ORAC

Sources of Antioxidants

By increasing the daily intake of antioxidants through diet and supplements, free radical activity within the body could be reduced.
Our bodies contain natural antioxidants in the form of vitamins, minerals and hormones, but due to the incredible amount of stress modern society puts on us it can be good to take in more in our diet.
Sources of antioxidants include vitamin E, vitamin C and beta-carotene. These can all be found in many fruits – such as elderberries and vegetables.

Antioxidative Capability of Elderberries compared to other fruit

In 2007, The United States Department of Agriculture looked at the oxygen radical absorbance capacity (ORAC) or overall antioxidant capability of various berries. They studied the antioxidant capacity of certain berries in terms of how effective they were at attacking these damaging free radicals. The higher the figure obtained the more antioxidant capacity the berries had.

Of the berries studied, the elderberry had one of the highest total antioxidant capacities.

"People are tired of taking pills, they want to eat functional foods that contribute to their health." Terry Durham, *Columbia Daily Tribune*

Oxygen Radical Absorbance Capacity (ORAC) of Selected Fruits

Fruit	ORAC mmol TE/100g			Total Phenolics (mg GAE/100g)
	Hydrophilic ORAC	Lipophilic ORAC	Total ORAC	
Blackberry	5245	103	5347	660
Blueberry	6520	36	6552	531
Cherry (sweet)	3348	17	3365	339
Chokeberry	15820	242	16062	2010
Cranberry	9382	202	9584	718
Elderberry	*14500*	*197*	*14697*	*1950*
Grape, red	1260	NM	1260	177
Orange	1785	34	1819	337
Plum	6241	17	6259	367
Raspberry	4745	138	4882	502
Strawberry	3541	36	3577	368
Tomato, plum	546	NM	546	36

Source: United States Department of Agriculture Oxygen Radical Absorbance Capacity (ORAC) of Selected Foods - 2007

- **Fruit**
  - **Culinary uses**
  - **Dried in energy bars, fruit mixes**
- **Juice**
  - **Colorant**
  - **Medicinals - concentrate, extract, tincture and syrup**
  - **Jams, jellies**
  - **Vinegar**
  - **Wines, meads and spirits**
  - **Enhanced waters, juice blends, other drinks**
- **Blossoms**
  - **Flavoring for wines, enhanced waters**
  - **Teas**
- **Wildlife habitat**

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Landscape architects have begun to specify ‘edible’ elderberry (canadensis) to create wildlife habitat and feed people.

ELDERBERRY: VARIETIES & SELECTIONS

- **Improved cultivars**
  - **New York cultivars**
    - **Adams 1 (1926)**
    - **Adams 2 (1926)**
    - **Ezyoff (1938)**
    - **York (1964)**
  - **Canada cultivars**
    - **Johns (1954)**
    - **Nova (1960)**
    - **Scotia (1960)**
    - **Kent (1960)**
    - **Victoria (1960)**
  - **European elder cultivars**

Adams 2

‘Wyldewood’ Elderberry

- Collected from the wild by Jack Millican near Eufala, OK, in 1995
- Provided to the Elderberry Improvement Project in 1998 by Margaret Millican
- Originally described and tested as ‘Brush Hills 1’ and ‘Wyldewood 1’

Dense flower cluster of 'Wyldewood'

- Tall shrub reaching 225 cm, with a spreading to upright growth habit.
- Timing of spring budbreak is similar to that of 'Adams II'.
- Blossoms in June; florets are easily removed from the cyme for use as a dried product or as a flavoring.
- We have not investigated the pollination requirements for 'Wyldewood'; however, fruit set is reliable and prolific.

Wyldewood

- **Harvest season generally 14-26 days later than 'Adams II'; late July in Missouri.**
- **Primary shoots ripen fruit over a 3-week period; three harvests at 7-day intervals.**
- **Unpruned plants ripen fruit for a 4-week period**

'Wyldewood'

- **Laboratory testing of fruit harvested from both sites over three years indicated:**
  - **Mean juice pH of 4.4**
  - **Mean total soluble solids of 9.5 °Brix**
  - **Mean titratable acidity in terms of tartaric acid of 0.70 g/100 ml**

- **Rated as slightly to moderately susceptible to leaf spot diseases.**
- **Eriophyid mites (Eriophyidae) were noted as a slight problem at both sites.**
- **Disease and mite susceptibility were not significantly different from 'Adams II'**

‘BOB GORDON’ Elderberry

- **Medium shrub to 217 cm, with a spreading to upright growth habit.**
- **Spring budbreak is later than ‘Adams II’**
- **Blossoms in late May-mid June**
- **Florets are easily removed from the cyme for use as a dried product or as a flavoring.**
- **We have not investigated the pollination requirements for ‘Bob Gordon’.**

An example of Bob Gordon’s determinate flower head.

- **Identified and collected from the wild by Robert Gordon, Charlotte Cooper, and Andrew Thomas near Osceola, MO, on September 29, 1999.**
- **Originally described and tested as ‘Gordon B’**

‘Bob Gordon’

- The fruit cymes of present in a decumbent position at ripening, which may make the berries less attractive to birds
- The cymes at harvest are large compared to ‘Adams II’ and somewhat loose
  - Average size of 67.5 g on unpruned plants
  - Average size of 126.6 g on plants that are annually pruned to the ground.

‘Bob Gordon’

- **Berries**
  - **dark purple,**
  - **ripen uniformly in the cymes**
  - **resistant to shattering.**
- **Berry size averaged 91.6 mg and 88.5 mg in two studies.**
- **Yield variability was noted between the Mountain Grove and Mount Vernon sites, with Mountain Grove plots producing higher yields but smaller berries than the Mount Vernon plots.**

‘Bob Gordon’

- **Laboratory testing of fruit harvested from both sites over three years indicated:**
  - **mean pH of 4.73**
  - **total soluble solids of 11.62°Brix**
  - **titrateable acidity in terms of tartaric acid of 0.65 g/100ml**

- **‘Bob Gordon’ was rated as slightly to moderately susceptible to leaf spot diseases**
- **Eriophyid mites (Eriophyidae) were noted as a slight problem at both sites**

‘Bob Gordon’ had significantly less disease and mite damage than ‘Adams II’ in one study while disease and mite susceptibility were not significantly different from ‘Adams II’ in a second study

‘RANCH’ Elderberry

- First to bloom
- Determinate
- Drought resistant/heat tolerant

‘ADAMS II’ Elderberry

- Released in 1926
- Indeterminate
- Similar to Wyldewood bloom time
- Standard to which all varieties are tested
- Continues to be one of the best varieties

Pest Issues

Eriophyid mite

Bacterial leaf spot

Elderberries in Missouri: Wild to Cultivated

Wild elderberries grow along roadways and near streambeds..

Propagation

Soil is mixed; cuttings are placed in the medium.

4-week old cuttings in greenhouse, roots are beginning to sprout.
Root stimulation growth medium is used to ensure a healthy start.

After ten to twelve weeks in the green house; cuttings are ready to plant in the orchard.

Field Preparation

Tilling is complete.
Notice the row marker that helps define proper spacing.

The black plastic weed barrier is laid.

Cuttings will be planted next.

Loading the waterwheel planter, which allows two people to set up to 1000 plants in an hour.

On the planter.

Here the cover crop was well established before preparing the beds for planting.


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Rooted cuttings
set in black plastic.


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The side discharge mulching machine.

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Mowing Season. The orchard is beginning to flower.

Berry set. Notice how stems turn purple as berries ripen.

Berry set and flowers on the same cyme, notice the umbel shape.

3-year-old nursery plants.

Cymes can grow quite large: 2000 or more small individual flowers in a cyme.
Very Striking as a landscape specimen.

A specimen in full flower beginning to set berries

A specimen with ripe berries almost ready for harvest.

Nearing Ripeness

Determinate
Ranch

Indeterminate
Wyldewood

Qualities of Ripeness

- Dark
- Dusky
- Not red or green

AGROFORESTRY IN ACTION

University of Missouri Center for Agroforestry

Using NRCS Technical and Financial Assistance to Establish Elderberries

by Larry Godsey, Ph.D., NRCS Economist, Laura Cartwright, State Agricultural Economist and Nicki Grudzinski, Video Director

The Natural Resources Conservation Service (NRCS) is an agency of the US Department of Agriculture that is responsible for assisting landowners to improve our soil, water, air, plants, wildlife and energy use. Treating productive lands in harmony with a healthy environment is the vision of NRCS. Establishing elderberries on private land and managing elderberries for aesthetic benefit, wildlife benefit, production benefit, or a combination of all three uses is consistent with NRCS goals and vision.

NRCS provides assistance to landowners in the form of Conservation Technical Assistance and Financial Assistance. Conservation Technical Assistance is the help that NRCS and its partners provide to private landowners to address opportunities, concerns and problems related to the use of natural resources and to help landowners make sound natural resource management decisions on private, tribal and other non-federal lands. Conservation Technical Assistance is voluntary and free. One of the most beneficial outcomes of participating with NRCS Conservation Technical Assistance is the development of a Conservation Plan specific to each landowner's property and goals. A conservation plan provides the landowner with a comprehensive overview of their land and identifies potential conservation practices and activities on the landscape that meet the landowner's goals and objectives. The Conservation Plan includes natural resource information, a record of decisions, and a schedule of events or operations. Conservation Plans are meant to be site specific, comprehensive and action oriented to result in improvement in resource management according to the landowner goals. In addition to developing a conservation plan, Conservation Technical Assistance can also be used to assess resources, design practices, monitor resources, or follow up after conservation practices are installed. NRCS in Missouri has 108 field offices servicing all 114 counties staffed with certified conservation planners. The first step in receiving Conservation Technical Assistance is to locate the county USDA Service Center and make an appointment with a conservation planner. To locate the nearest USDA Service Center go to http://offices.sc.egov.usda.gov/locator/app.

1 www.centerforagroforestry.org

Elderberries are very easy to grow. They are perennial, are excellent at preventing soil erosion and for filtration; better in fact than grasses. They are beautiful and graceful in our landscapes. Elderberries are also great windbreaks, they make excellent habitat and attract more beneficial creatures than just about any native American berries. Plant some today.

Printable version on our website

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The fruits of your labor: Buckets of harvested berries.

De-stemming Machine 2011 Prototype

2014 De-stemmer

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From field to freezer in the same day.

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Berries fall through
a screen into tubs for
transport to the wash station

The stems are swept from the
machine into tubs for removal

Sanitized, washed, and dried berries are put into 25 pound food grade buckets and frozen for transport to underground deep freezer storage.

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Field Tour & Training develop knowledge and skills in Elderberry culture and harvest techniques

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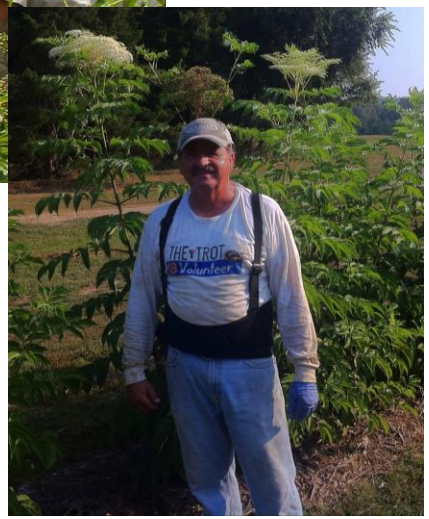

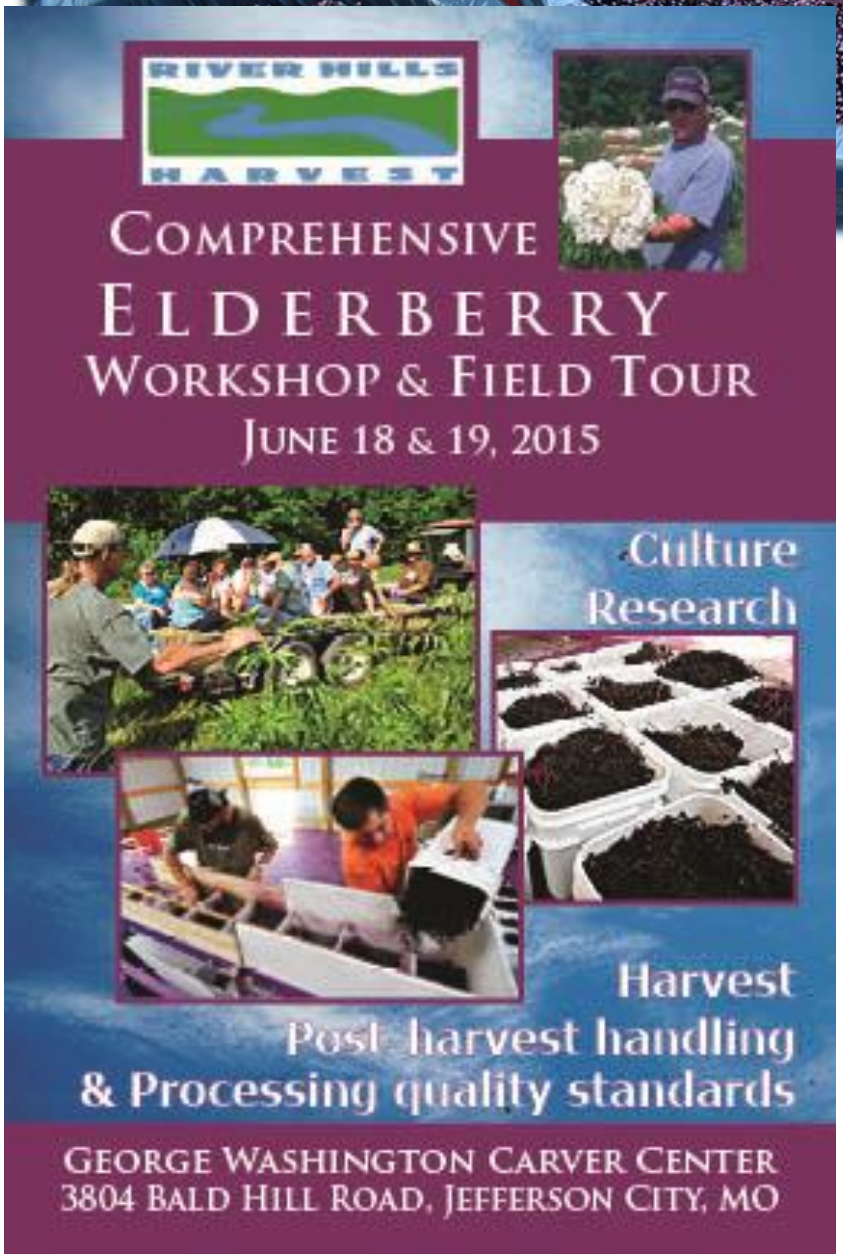

Registration information:

2015 elderberryworkshop.wordpress.com (no spaces or caps)

Call 573-424-9693 for info.
Mail in registration and fees.

www.riverhillsharvest.com

Any Questions

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Thanks for attending the Cultivating Elderberry as a Cash Crop Seminar

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