NICHE CROPS: Currants and Aronia

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**Ribes**

- **Red and White Currants:**
  - *Ribes rubrum, R. petraeum, R. sativum*
  - Only difference between red and white is fruit color

- **Black currants:** *R. nigrum*
**Red and White Currants:**

*Ribes rubrum, R. petraeum, R. sativum*

- Native to cooler regions of Asia and Europe
  - Most cultivated currants are European selections
- 1868- ‘Fay’s Prolific’ – first American bred red currant
  - These were leading cultivars in early part of 20th Century
White Pine Blister Rust

• Arrived in America around 1900 when gooseberries and currants were rising in popularity and pine was an important lumber source

• 1930- Civilian Conservation Corps crews ripped out wild and cultivated *Ribes*
  – Not effective due to large number of wild *ribes*
White Pine Blister Rust

- 1966- Federal ban on *Ribes* lifted
- State bans- vary
  - Permit planting of any *Ribes*
  - All *Ribes* planting banned
  - Limited planting to certain species
  - Townships within a state can vary
PLANT BOTANY

- Small shrub, 1-1.5 m tall
- Non-thorny
- Deciduous
- 1-2 year old wood is most productive
- Productivity declines after 4 years
FLOWERS

• Non-showy flowers
• Self-fruitful
  – Fruit size larger with cross pollination
• Insect pollinated
• Prolonged flowering
• Small berries
• Racemous
• Anther filaments persist, remove before eating
  – Major limitation for fresh market
• Not a problem for processing
PLANT PRODUCTION
“The currant takes the same place among fruits that the mule occupies among draught animals- being modest in its demands as to feed, shelter, and care, yet doing good service.”

-19th Century Horticulturist
GENERAL GROWING CONDITIONS FOR CurrANTS

• Can tolerate mid-winter lows of -40°F or lower
• Require 800-1600 hr chilling period (32-45°F)
• 160-200 GGD
• 120-140 frost-free days
• USDA Hardiness zone: 3-5
• Will tolerate part- sun
SITE PREPARATION
SITE SELECTION

• Currants are cold hardy…but not heat tolerant!
• High summer heat can cause early defoliation and sun scald on the fruit
• Plant on north slopes in warm locations (several days >90°)
  – Can also reduce risk of frost damage
PLANT ESTABLISHMENT: SITE SELECTION

• Currants will tolerate cool wet soils

BUT

• Will be more productive in deep well-drained loam

• High organic matter is desirable

• Water table should not be less than 3’ deep
  – Raised beds may be needed
PLANT ESTABLISHMENT:
SOIL

• Prepare the soil *at least* 1 year before planting
  – Test soil and amend as needed (uofidaho)

<table>
<thead>
<tr>
<th>Nutrient</th>
<th>Test Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>P</td>
<td>100ppm</td>
</tr>
<tr>
<td>K</td>
<td>150ppm</td>
</tr>
<tr>
<td>Mg</td>
<td>&gt; 30ppm</td>
</tr>
<tr>
<td>Ca</td>
<td>1,000-5,000ppm</td>
</tr>
</tbody>
</table>

– Add organic matter
PLANT ESTABLISHMENT:  
WEED CONTROL

• Get rid of weeds before you plant!!!
  – Especially perennial weeds (quackgrass, canada thistle)
  – This may take a few years in very weedy sites

nps.gov
PLANT ESTABLISHMENT: WEED CONTROL

• Pre-plant control measures:
  – Cultivation
  – Cover crops
  – Green manure crops
  – Herbicide- systemic (ie. glyphosate) for perennial weeds
PLANT SELECTION

• One year old plants are best
  – Older plants are less vigorous

• Propagation
  – Can easily be propagated from cuttings or by layering
PLANTING

• Before planting:
  – Remove damaged roots/stems
  – Cut back top portion to 8-10”
    • Base amount cut back on size of roots
  – Lowest branch should be at soil depth
PLANT MAINTENANCE
Currants will *tolerate* poor conditions... 

**BUT**

Perform best with a little care!
FERTILIZATION

• N and K are most common limiting nutrients

• If soil was amended prior to planting, no additional P or K is necessary first year
### Ribes Fertilizer Recommendations

Table 7. Recommended amounts of commonly available fertilizers to apply annually to Ribes crops

<table>
<thead>
<tr>
<th>Year</th>
<th>Cow or horse&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Rabbit or poultry&lt;sup&gt;b&lt;/sup&gt;</th>
<th>10-10-10&lt;sup&gt;c&lt;/sup&gt;</th>
<th>18-5-10&lt;sup&gt;d&lt;/sup&gt;</th>
<th>21-0-0&lt;sup&gt;e&lt;/sup&gt;</th>
<th>46-0-0&lt;sup&gt;e&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 (planting)</td>
<td>5 (2.5)</td>
<td>1.5 (0.6)</td>
<td>4 (115)</td>
<td>2.2 (64)</td>
<td>1.9 (55)</td>
<td>0.9 (25)</td>
</tr>
<tr>
<td>2</td>
<td>5 (2.5)</td>
<td>1.5 (0.6)</td>
<td>4 (115)</td>
<td>2.2 (64)</td>
<td>1.9 (55)</td>
<td>0.9 (25)</td>
</tr>
<tr>
<td>3</td>
<td>8 (3.5)</td>
<td>2.0 (1.0)</td>
<td>6 (170)</td>
<td>3.3 (94)</td>
<td>2.9 (81)</td>
<td>1.3 (37)</td>
</tr>
<tr>
<td>4</td>
<td>10 (4.5)</td>
<td>3.0 (1.3)</td>
<td>8 (225)</td>
<td>4.4 (125)</td>
<td>3.8 (107)</td>
<td>1.7 (49)</td>
</tr>
<tr>
<td>5+</td>
<td>13 (6.0)</td>
<td>3.5 (1.7)</td>
<td>10 (285)</td>
<td>5.6 (158)</td>
<td>4.8 (136)</td>
<td>2.2 (62)</td>
</tr>
</tbody>
</table>

**NOTE:** Other manures and commercial fertilizer formulations can also be used to apply needed nutrients. Any one of the first four listed fertilizers and amounts provides all required nutrients. This table simply presents fertilizer options for growers to choose from.

<sup>a</sup> Cow and horse manures contain approximately 0.5% N, with varying amounts of P, K and other nutrients.

<sup>b</sup> Poultry and rabbit manures contain approximately 1.8% N, with varying amounts of P, K and other nutrients.

<sup>c</sup> 10-10-10 contains 10% each nitrogen (N), phosphorus (P<sub>2</sub>O<sub>5</sub>), and potassium (K<sub>2</sub>O).

<sup>d</sup> 18-5-10 is often formulated as a slow release fertilizer containing 18% N, 5% P<sub>2</sub>O<sub>5</sub>, and 10% K<sub>2</sub>O.

<sup>e</sup> Ammonium sulfate (21-0-0) and urea (46-0-0) contain 21% and 46% N, respectfully, but no P or K. These nitrogen-only fertilizers can be used to supplement complete fertilizers or are appropriate when soil and foliar tests indicate P and K are already adequate.
NUTRIENT MANAGEMENT PLAN

• Determining appropriate nutrient requirements requires site-specific information:
  – Soil test results
  – Soil and moisture characteristics
  – Crop history
  – Weather conditions

• Nutrient management is a DYNAMIC process
IRRIGATION

- Currants are tolerant of dry conditions
- In dry areas or areas with inconsistent rainfall, irrigation is recommended
  - Especially important during establishment
TRAINING SYSTEM

• Training systems:
  1) Bushes
  2) Fan trellis
  3) Cordon
GENERAL PRUNING PRINCIPLES

• Remove diseased or damaged canes

• Remove canes as close to the ground as possible

• Remove canes that are close to or lying on the ground

• Most fruit is borne on spurs of 2-3 yr old canes
PLANT SPACING

• Within row: 3’-5’
  – Closer for mechanical harvested

• Between rows 10’-12’
  – Modify to accommodate equipment and training systems
**Pruning Bushes**

- **Year 1:**
  - remove all but 6-8 canes

- **Year 2:**
  - keep 3-4 2 year old shoots
  - Keep four or five 1-year old shoots

- **Year 3:**
  - 3-4 each of 1, 2 and 3 year old canes

- **Year 4 and beyond:**
  - Remove all 4 year old canes
  - Keep 4 new 1 year old canes
PRUNING BUSHES

• Goal- each bush should have 9-12 canes:
  – 3-4 each of 1, 2 and 3 year old wood
  – Remove wood that is 4 years or older
Cordon Training System

1-yr branches spaced around cordon (photo: S. McKay, Cornell Extension)

Mature cordon-trained red currants in Dutch greenhouse (photo: S. McKay, Cornell Extension)
CORDON TRAINING SYSTEM

• Plant spacing: 18” apart
• 3 canes selected and trained up bamboo stake
  – 1 in center and 2 15cm on each side
  – Cordons grow 5-6’
  – Spare branch is left at the base in case a cordon dies
Cordon trained red currants
(Photo: Steve McKay, Cornell extension)
Cordon Pruning

• After harvest, *all fruiting wood is removed*
• Small branches and misplaced branches are removed
• Leave medium sized branches that will produce fruit following year
• Vigorous lateral branches can be headed
• *Plant is completely renewed every year*
  – Cordon is only permanent wood
GROUND MANAGEMENT
**WEED MANAGEMENT**

- Weed control is critical for *Ribes* crops
  - Shallow root system is not competitive
  - Clean understory can reduce pest and disease problems
  - Limited herbicide options
**Weed Control Strategies: Mulches**

- Bark, compost, row clippings
  - Can create rodent habitat
  - Consider nutrient contributions
- Black plastic
  - Effective weed control strategy
  - Canadian trial: higher yields when combined with bare alleys
- Weed barrier fabric
Weed Control: Cultivation

• Must be shallow (2” or less)
  – Deep cultivation can damage currant roots

• Good for annual weeds

• Not good for perennial weeds
  – Break up rhizomes and increase number
Harvest

- Fruit are harvested before colour becomes dull red (over ripe)
- Soluble solids of 9.5-14%
- Acidity 2%
- Harvest entire cluster
  - Requires cultivar with uniform ripening
- Do not harvest when fruit are wet
POST HARVEST HANDLING

- Place in forced air cooler at 95% humidity
- Not chilling sensitive
- Store at 32-34°F with 95% RH
- Can store up to 2.5 weeks
RETAIL DISPLAY

- Currants should be in refrigerated case
- Do not mist or top-ice the berries
PEST MANAGEMENT
INSECTS

• Insects are not a major problem for currants in most years
  – Currant aphid
  – Currant Borer
  – Imported Currant Worm
  – Currant stem borer
  – Gooseberry Fruitworm
  – Currant Fruit Fly
  – Fourlined plant bug
  – San Jose Scale
DISEASES

• Powdery Mildew
• Anthracnose
• Leaf Spot
• Minor:
  – White Pine Blister Rust
  – Botrytis
  – Cane blight
  – Cluster cup rust
ARONIA MEALNOCARPA
(BLACK CHOKEBERRY)
ARONIA MELANOCARPA

- Native shrub to North America - 3-9’ tall
  - Often found in wet woods and swamps

- Native to North America, but cultivars have been developed in Europe
  - Most production occurs in Europe
  - ‘Nero’ and ‘Viking’ most common in US

- Plants are self-fertile

- Tolerant of a wide range of soil conditions
  - pH 4.5-6.5 ideal

- Few pests in the midwest
ARONIA DISTRIBUTION

**Suitability/Use**
- Berry/Nut/Seed Product: No
- Christmas Tree Product: No
- Fodder Product: No
- Fuelwood Product: No
- Lumber Product: No
- Naval Store Product: No
- Nursery Stock Product: No
- Palatable Browse Animal: Medium
- Palatable Graze Animal: Medium
- Palatable Human: No
- Post Product: No
- Protein Potential: No
- Pulpwood Product: No
- Veneer Product: No
ARONIA PRODUCTION

• Tolerant of a wide range of soil conditions
  – pH 4.5-6.5 ideal
  – Less fertile soils are desirable to control size

• Few pests in the midwest
PLANT ESTABLISHMENT

• Plant spacing: 0.8-1.0 m (~3’)
  – 1 A can support 700 plants

• Weed Control:
  – Must control weeds during establishment
  – Can use plastic/fabric mulch to aid weed control

• Will establish into a dense hedge row and weeds will be out-competed
PLANTING MAINTENANCE

• Flower mid-late May- little frost damage

• Year 5-7- start to selectively prune out oldest canes to maintain productivity

• Sod or cover crop between rows
Harvest

- Fruit matures between Aug and September
- Mechanically harvested (blueberry harvester)
- Full yield potential reached in 5 years
- Yields up to 14,000 lbs/A
  - 2008 price: $1.00-$1.45/lb
PRODUCT USE

• Very astringent fruit
• Primarily used in processing:
  – wine, jams, jellies, juice, salsa, tea, syrup, and baked goods
• Deep natural color
  – Can be used in juices, ice cream, yogurt
MARKETING

• Black currants
  – More astringent, higher aromas, so good for processing

• Red Currants
  – Less astringent than black but still primarily used for processing

• White Currants
  – Lowest acidity and best suited to fresh
MARKETING NICHE/NOVEL CROPS

• Currants are a niche crop...do not assume you will be able to sell them!
• Customers often do not know what to do with an unfamiliar crop
  – Educate customers about the fruit
  – Provide tips/recipes for how to use them
• Explore options with processors/wineries prior to planting
  – Talk specifics (ie. volume, delivery expectations, schedule, payment)