

*Viburnum.*

*A plant for all seasons*



*Well Known horticulturist Michael Dirr once wrote,  
"A garden without Viburnums is akin to life without music and art."*

# Animal Repellents

<http://www.wildlifehotline.org/deerrepellents.html>

wildlifehotline.org

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## Repellents



### Q: What Makes Some Repellents More Effective than Others?

**A:** The most effective repellents tend to be those that produce sulfurous odors and are considered "fear-inducing." These repellents depend completely on detection through odor. It is believed that deer associate a sulphur smell with the presence (or carcass) of a predator. (Some deer repellents and homemade recipes contain animal-based ingredients, and their discussion here for educational purposes does not imply endorsement by The HSUS.) Not all sulphurous odors are equally effective, however. For example, compounds containing garlic seem to be less effective than sulphur compounds in urine.

Aside from fear-inducing odors, repellents use other modes of action (some repellents combine several modes of action)

which include:

- Taste: these include bitter ingredients that presumably create a bad flavor. These must be continually applied to the growing parts of plants.
- Pain: these include ingredients like hot pepper (capsaicin) or ammonia, which cause irritation on contact with the mucous membranes, eyes, mouth, nose or gut.
- Conditioned aversion: these products cause animals to form an association between the treated item and a feeling of sickness, usually gastrointestinal.

There are two kinds of delivery systems for repellents: topical (repellent placed directly on the targeted plant) and area (such as scent packets, where the protection zone is meant to extend beyond the immediate area where the repellent is present). In general, topical repellents appear more effective than area-based ones and odor-based repellents tend to outperform taste-based repellents. Taste receptors in animals are different than those in humans. Some chemical compounds which are extremely bitter to humans tend not to bother deer at all (Lutz and Swanson).



### Tips for Successful Repellent Application

- All repellents work best if applied before the deer's feeding pattern becomes established. This means applying repellents before bud-break and as new growth appears. You don't want to break a browsing habit, but rather prevent one from forming!
- Because rainfall washes off repellents, you'll need to reapply repellents after heavy rains. We recommend routine reapplication at least every 3-4 weeks so that new, growing plant parts are protected as well.
- Deer may become accustomed to the same repellent and ignore it over time. Alternating repellents may help to keep the deer confused and more wary.
- At the height of growing season, you might consider choosing an odor repellent over a taste-based one. Taste-based repellents need to be constantly applied to any new growth to keep the whole plant tasting bad.
- The longevity of some repellents can be enhanced by adding a "sticker," which is an adhesive product that literally makes the repellent "stick" to the plant longer! Some commercial "stickers" are *Wilt Proof*, *Vapor Gard* and *WeatherShield* and can be purchased at garden stores. Some repellents already contain a sticker as part of their formulation.



### Q: How Do I Choose a Repellent?

**A:** Many repellents are stocked by your local garden, farm supply or hardware store, and it's a good idea to ask what seems to be working best in your area since the effectiveness of repellents varies locally and regionally. Ask your neighbors what works for them. Overall, the one repellent that seems to score highest most consistently is *Deer Away Big Game Repellent*.

### Non-Commercial Repellents

**Soap Bars:** Hanging a bar of soap, particularly *Irish Spring*, from a bush or tree will help protect it. Be sure to leave the soap wrapper ON and drill a hole through the center of the soap and suspend it with a string. The brand of soap you choose must be high in tallow fatty acid. Glycerin and coconut-based fatty acid soaps do NOT seem to repel deer well. Disadvantage: the sphere of protection is limited to the immediate area around the tree/bush. Be sure to hang the soap bars no more than 3 feet apart, up to a height of 6 feet, all around the tree/bush.

**Human Hair:** Although hanging sachets of human hair costs very little, it does not consistently repel deer. Hair can be obtained from beauty salons and barbershops quite easily, however. Hair should be bagged in 1/8-inch mesh bags or nylon stockings, and contain at least 2 handfuls of hair apiece. Bags should be hung at least 3 feet apart from each other and up to a height of 6 feet if the tree/bush to be protected has a wide diameter. Refresh the bags monthly with fresh hair. Some users have found that periodically spraying the bags with cologne or aftershave enhances their effectiveness!

### Homemade Solutions:

- Mix 3 eggs well in a blender. Mix with 1 gallon of water. Spray on plants. Reapply after heavy rains. Disadvantage: this solution may clog sprayer.
- Mix 4 eggs, 2 oz. red pepper sauce, 2 oz. chopped garlic. Blend with enough water to make 1 quart. Strain and apply with spray can. This is the *Consumer Reports* recipe.

### Commercial Repellents

**Note:** See [Table of Deer Repellents](#) for more options and a full ingredient list. Some commercial deer repellent products contain animal-based ingredients, and their listing here for educational purposes does not imply endorsement by The HSUS.

**Deer Away Big Game Repellent (BGR):** This product comes in both a powder and liquid form (the product's powder form seems more effective than the liquid form) and is considered by researchers to be the most consistently effective deer repellent. BGR is an odor-based repellent comprised mostly of putrescent egg solids. It is usually available in garden stores.

**Wildlife Max Soap and Deer Away Soap and Rabbit Repellent (now marketed as Cat Away Animal Repellent):** Both of these products rely on tallow-based

Humane solutions for urban wildlife conflicts.

# Animal Repellents

TRADE NAME	ACTIVE INGREDIENT(S)	COST OF ONE QUART OF READY-TO-USE	SOURCE	COMMENTS
*Deer Away Big Game Repellent (comes as a concentrate, powder, or a RTU form called "Deer and Rabbit Repellent")	Putrescent eggs 4.63% in RTU, 37% in concentrate	Ready-to-use \$17.99 Concentrate \$9.95 Powder: 1 lb \$24.95	Intagra 8906 Wentworth Ave. S. Bloomington, MN 55420 (800) 468-2472 www.intagra.com	This putrescent egg-based repellent scores most highly in repellent studies. Powder form of product seems most effective. Odor based. Reapply every 4 weeks.
*Deer Off	.7813% egg solids; 0.0006% capsaicin and 0.0006% garlic in RTU	\$18.99	Deer Off 1492 High Ridge Rd. Suite 5 Stamford, CT 06903 (203) 968-8485 www.deeroff.com	This product combines taste (capsaicin) and odor (egg) for repellency effect. Reapply every 3-4 weeks.
*Liquid Fence	Contains egg solids (co. won't reveal %); 3% garlic powder	\$11.95	Liquid Fence Inc. PO Box 300 Broadheadsville, PA 18322 (888) 923-3623 www.liquidfence.com	Odor and taste-based repellent. Reapply after one week and then monthly.
*Plantskydd	87% edible animal protein (bloodmeal); 3% vegetable fat; 5% salt; 5% water	\$27.00	Tree World 4466 Stalashen Dr. Sechell BC, Canada V0N 3A1 (800) 252-6051 www.plantskydd.com	A new product from Scandinavia, odor-blood-based ingredients. Scored highly in studies.
Miller's Hot Sauce	2.5% capsaicin	\$98.00 per half gallon (not sold by RTU quart)	Miller Chemical PO Box 333, 120 Radio Rd. Hanover, PA 17331 (800) 233-2040 www.millerchemical.com  <i>* company will consult with you to make sure product fits your problem specifics</i>	Be sure to add a sticker (ex: Vapor Gard). <b>This product must be handled very carefully due to capsaicin (hot pepper)!</b>  Manufacturer suggestion for heavy deer browsing: Apply at ratio of 1-2 quarts repellent, 1-2 quarts sticker (ex: Vapor Gard), to 100 gallons water.
*Deer Stopper	Mint oil, rosemary oil, sodium chloride  Egg solids: 1.52% in RTU, 15.2% in concentrate	\$16.99	Landscape Plus PO Box 122 Chester, NJ 07930 (908) 832-0711 www.deerstopper.com	A new formulation containing herbal oils.
DeerBusters Deer and Insect Repellent	3.33% garlic	\$19.95 with hose-end sprayer attachment	DeerBusters 9735A Bethel Rd. Frederick, MD 21702 (888) 422-3337 www.deerbusters.com	This garlic-based repellent doesn't persist long so it must be re-applied every 7 days and after rain.
Get-Away Animal Repellent	.625% capsaicin, .21% allyl isothiocyanate (mustard)	\$17.99	Intagra 8500 Pillsbury Ave. Minneapolis, MN 55420 (800) 468-2472 www.intagra.com	This product scored fairly well in a recent study. Taste/pain based repellent. Reapply every 2 weeks.
*Hinder	RTU: consists of .66% ammonium salts of higher fatty acids Concentrate: 13.8% ammonium salts of higher fatty acids	RTU 24 ounce \$12.99 \$25.00 for one gallon of concentrate	E. M. Matson Jr. Co. Inc. PO Box 1820 North Bend, WA 98045 (425) 888-6212	One of the few products registered for use on edible plants. Reapply every 2 weeks.
*Deerbusters Deer and Rabbit Repellent	Concentrate: 13.8% ammonium salts of higher fatty acids	\$33.95 for concentrate	DeerBusters 9735A Bethel Rd. Frederick, MD 21702 (888) 422-3337 www.deerbusters.com	This product can be used on edible plants. Reapply every 2 weeks.

# Genetic Profile of *V. x burkwoodii*

*V. carlesii* x *V. utile*



# Genetic Profile of *V. x burkwoodii*

- *V. x burkwoodii* (*V. utile* × *V. carlesii*)
- *V. x burkwoodii* ‘Anne Russell’ (*V. x burkwoodii* × *V. carlesii*)
- *V. x burkwoodii* ‘Conoy’ (*V. utile* × *V. x burkwoodii* ‘Park Farm Hybrid’)
- *V. x burkwoodii* ‘Fulbrook’ (sister seedling to Anne Russell)
- *V. x burkwoodii* ‘Mohawk’ (*V. x burkwoodii* × *V. carlesii*)
- *V. x burkwoodii* ‘Park Farm Hybrid’ (sister seedling of *V. x burkwoodii*)
- *V. x burkwoodii* ‘Sarcoxie’ (*V. x burkwoodii* × *V. carlesii*)

# Genetic Profile of *V. x carlcephalum*

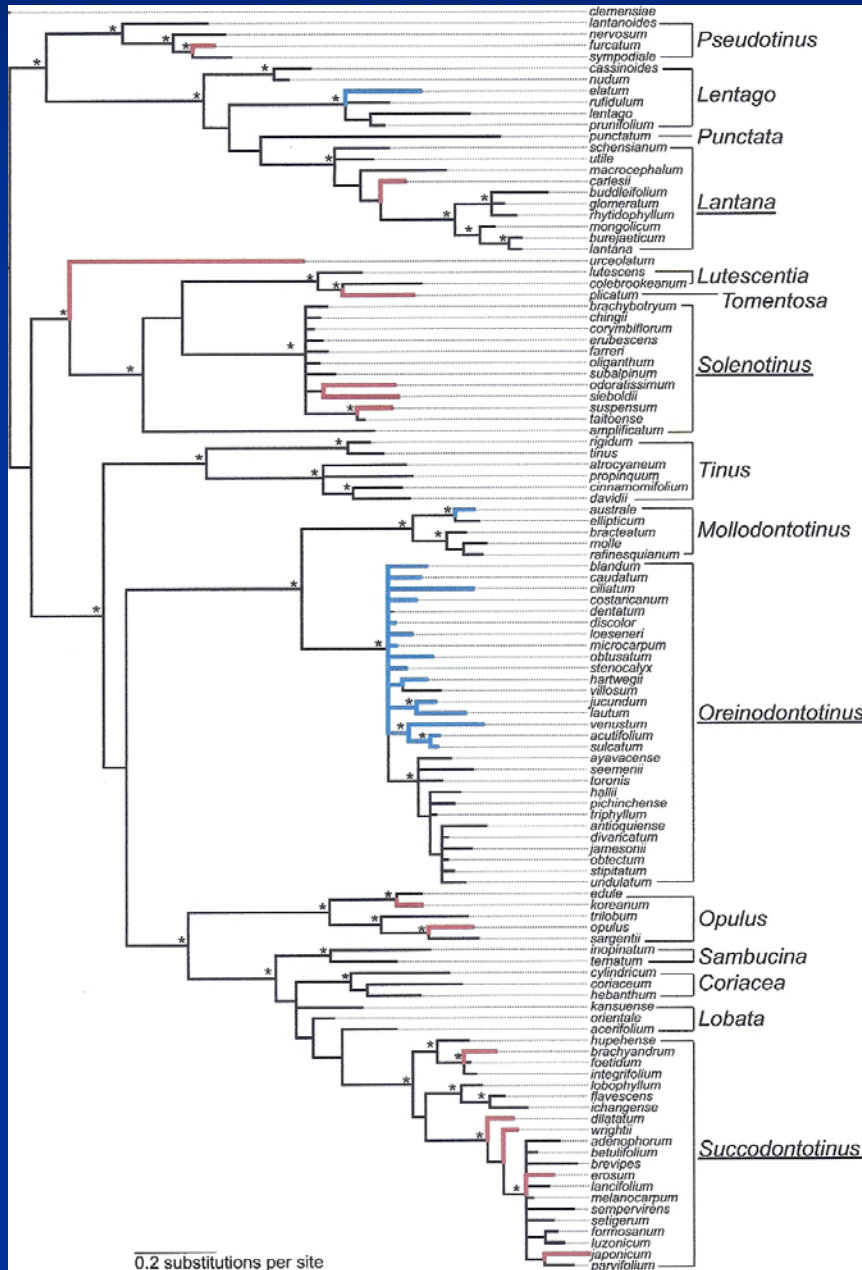
*V. carlesii* x *V. macrocephalum* f. *keteleeri*



# Genetic Profile of *V. x carlcephalum*

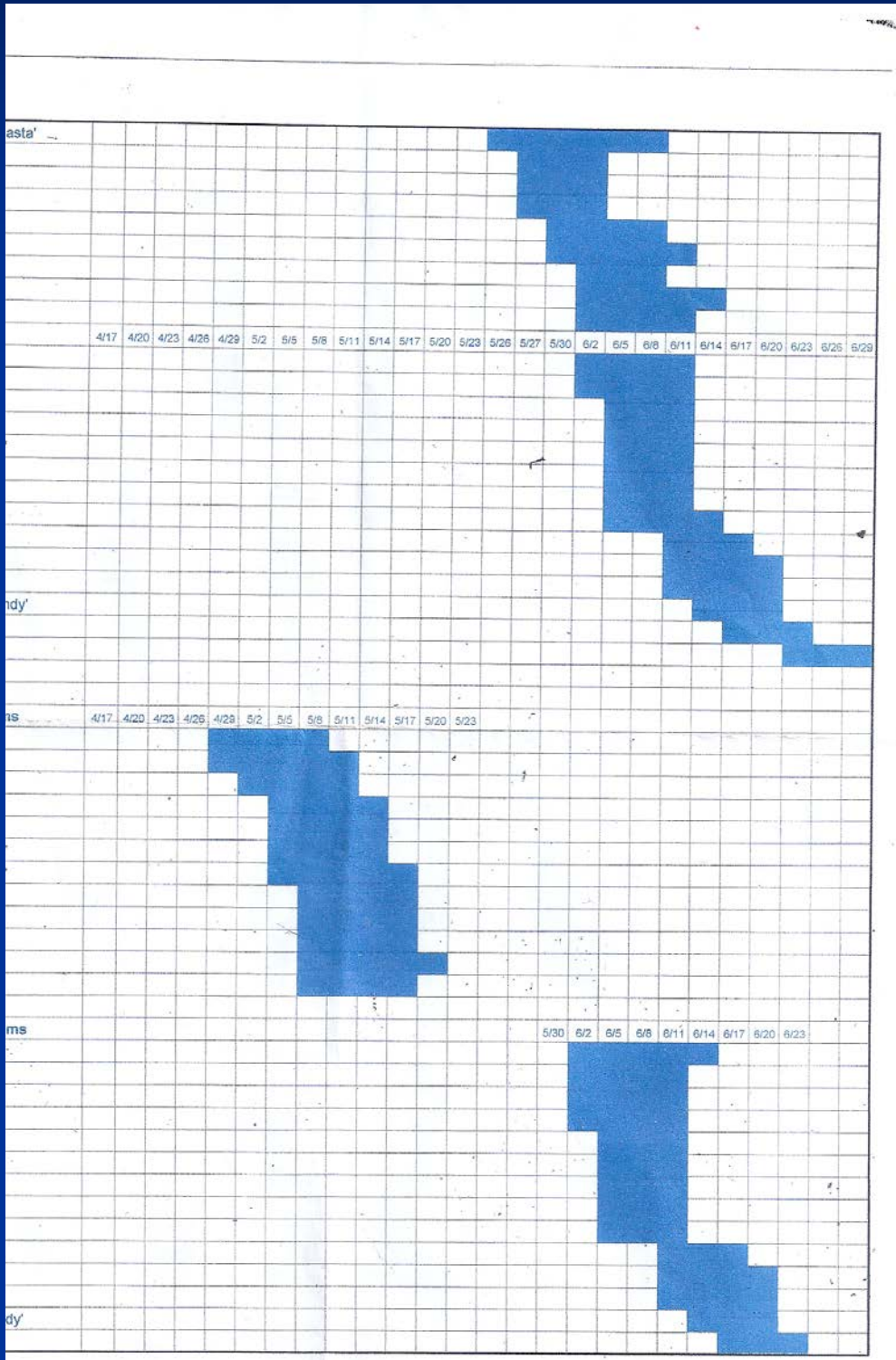
- *V. x carlcephalum* (*V. carlesii* × *V. macrocephalum* f. *keteleeri*)
- *V. x* ‘Cayuga’ (*V. carlesii* × *V. x carlcephalum*)
- *V. x* ‘Chesapeake’ (*V. x* ‘Cayuga’ × *V. utile*)
- *V. x* ‘Eskimo’ (sister seedling to above cross was selfed)

# Viburnum Genetic Alliances





# V. dentatum Bloom Sequence



# Industry Survey Results

- Boxwood
- Viburnum
- Holly
- Spirea
- Azalea
- Maple
- Juniper
- Dogwood
- Knock out roses

# Viburnum facts

- 175+ species
- Range in size from a compact 2 ½' shrub to large 20'+ shrubs or multi-stemmed ornamental trees.
- Can be pruned into a single stemmed tree
- Most are very heat and drought tolerant.
- Prefers acidic soil ph of <7.0
- Fruit is a drupe – a fleshy outside covering a hard stone containing a single seed
- Leaves are always arranged opposite
- 4 seasons of landscape interest
- With some exceptions, fruiting is best when a pollinator is planted nearby
- Bloom period – early April to late June
- Excellent habit and food source for wildlife
- A value added plant

# Viburnum size diversity



# Viburnum – A plant for all seasons

- Spring
  - colorful flower buds
  - fragrant and non-fragrant flowers
  - colorful emerging spring foliage
- Summer
  - late blooming species
  - fruit
  - various leaf shapes, textures, and colors
- Fall
  - fruit
  - autumn coloration
- Winter
  - winter buds
  - evergreen foliage
  - persistent fruits
  - interesting bark

# Spring Flower Buds



# Spring Flowers



# Spring Foliage





# Summer Flowers



# Summer Foliage



# Summer Fruit



# Summer Fruit



# Fall Fruit



# Fall Fruit



*V. rufidulum*



# Fall Foliage



# Fall Foliage

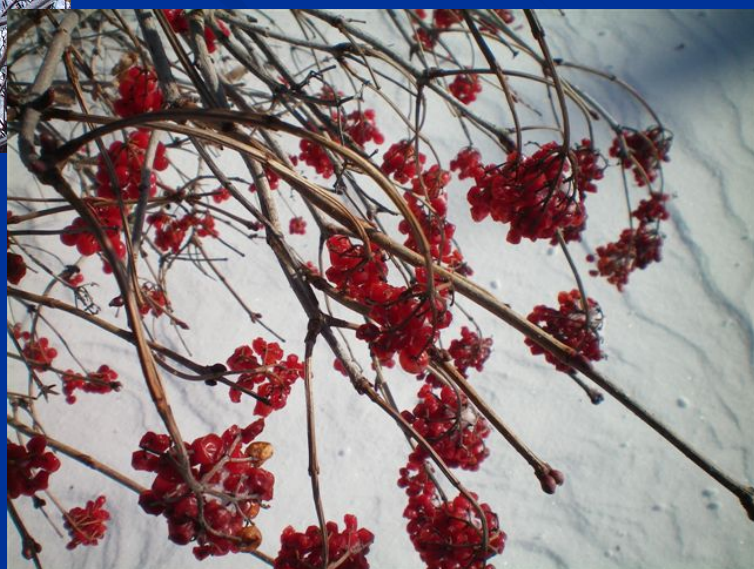
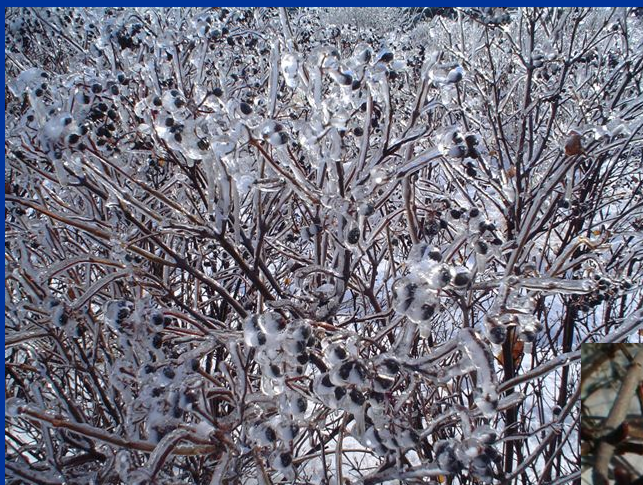




# Winter bark, fruit, and foliage



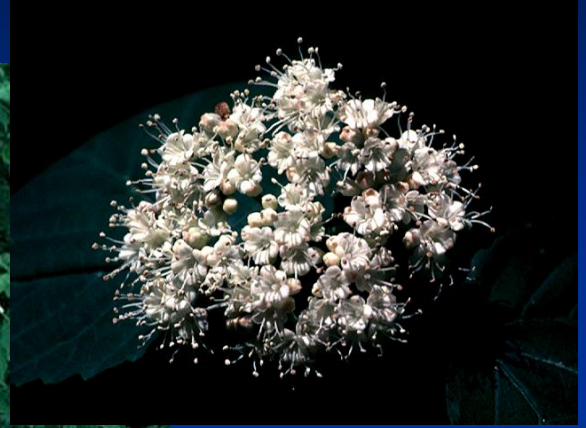
# Winter bark, fruit, and foliage



# Winter Buds



# *V. acerifolium*



## Fragrant Viburnums

- *V. bitchiuense*
- *V. x burkwoodii* '*Compact Beauty*'
- *V. x bodnantense* '*Dawn*'
- *V. carlesii* '*The Blues*'
- *V. carlesii* '*Prairie Rose*'
- *V. farreri* '*Nanum*'
- *V. x 'Sarcoxie'*

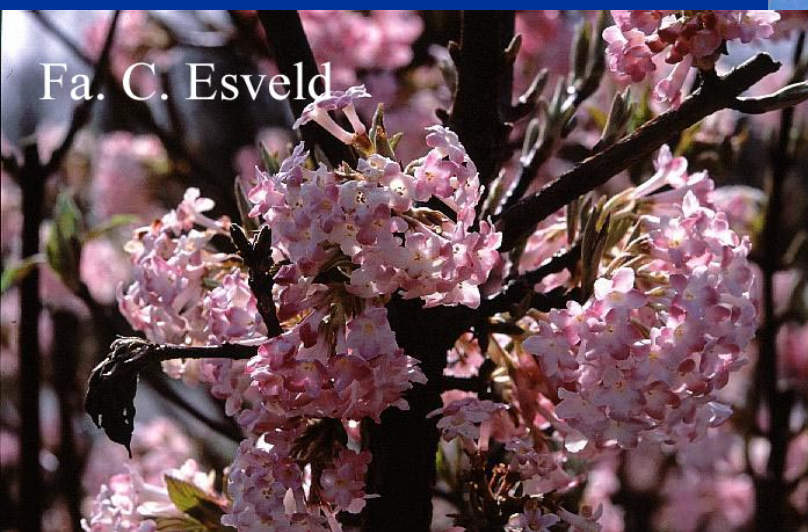
# V. bitchiuense



*V. x burkwoodii* 'Compact Beauty'



*V. x bodnantense* 'Dawn'  
*V. farreri* x *V. grandiflorum*





*V. x bodnantense* 'Charles Lamont'



*V. carlesii* 'Prairie Blues'™



# *V. carlesii* 'Prairie Rose'™



*V. x 'Cayuga'*  
(*V. carlesii* X *V. x carlcephalum*)



# *V. farreri* 'Nanum'



*V. x 'Sarcoxie'*  
(*V. x burkwoodii* 'Sarcoxie')



# V. x *'Sarcoxie'*



*V. x burkwoodii* 'Conoy'





*V. x burkwoodii* 'Conoy'



# *V. cassinoides*



# *V. cassinoides*



# V. cassinoides



*V. nudum* 'Pink Beauty'



# *V. nudum* 'Angustifolium'



# V. nudum fruit



# V. nudum pollinators

- V. nudum
- V. nudum '*Angustifolium*'
- V. nudum *Brandywine*<sup>TM</sup>
- V. nudum '*Callaway small leaf*'
- V. nudum '*Callaway large leaf*'
- V. nudum '*Count Pulaski*'
- V. nudum '*Earthshade*'
- V. nudum '*Longwood*'
- V. nudum '*Moonshine*'
- V. nudum '*Pink Beauty*'
- V. nudum '*Winterthur*'



**V. x 'Chesapeake'**  
(*V. x 'Cayuga'* x *V. utile*)



**V. x 'Eskimo'**  
(*V. x 'Cayuga' x V. utile*)



# Viburnum dentatum (Arrowwood Viburnum)

- V. dentatum *Blue Blaze*™
- V. dentatum var. *deamii*
- V. dentatum *Fireworks*™
- V. dentatum '*Golden Arrow*'
- V. dentatum *Indian Summer*™
- V. dentatum '*Little Joe*'
- V. dentatum '*Moonglo*'
- V. dentatum *Raspberry Tart*™

# V. dentatum foliage



*V. dentatum* *Blue Blaze*™



# *V. dentatum* var. *deamii*



*V. dentatum* var. *deamii*



*V. dentatum* var. *deamii*





*V. dentatum* var. *deamii*



**V. dentatum var. deamii**



# *V. dentatum* var. *deamii*



*V. dentatum* *Fireworks*™



*V. dentatum* 'Golden Arrow'



*V. dentatum* *Indian Summer*<sup>TM</sup>



# *V. dentatum* *Indian Summer*<sup>TM</sup>



*V. dentatum* 'Little Joe'





# *V. dentatum* 'Moonglo'



*V. dentatum* 'Moonglo'

*V. dentatum* 'Moonglo'



*V. dentatum* 'Moonglo'



*V. dentatum* 'Moonglo'



*V. dentatum* 'Moonglo'



*V. dentatum* 'Moonglo'



*V. dentatum* 'Moonglo'



# *V. dentatum Raspberry Tart*<sup>TM</sup>





# Viburnum dilatatum (Linden Viburnum)

- *V. dilatatum* 'Asian Beauty'
- *V. dilatatum* 'Catskill'
- *V. dilatatum* 'Iroquois'
- *V. dilatatum* 'Michael Dodge'
- *V. dilatatum* 'Mt. Airy'
- *V. x* 'Oneida'

# *V. dilatatum* 'Asian Beauty'



*V. dilatatum* 'Catskill'



# *V. dilatatum* 'Troquois'



# *V. dilatatum* 'Michael Dodge'



# *V. dilatatum* 'Mt. Airy'



# V. x 'Oneida'

(*V. dilatatum* x *V. lobophyllum*)



*V. lantana* 'Variegatum'





*V. lantana* 'Variegatum'



*V. lantana* 'Variegatum'



# *V. macrocephalum*



# V. macrocephalum



*V. macrocephalum* f. *keteleeri*



*V. plicatum*  
(Japanese snowball)

vs.

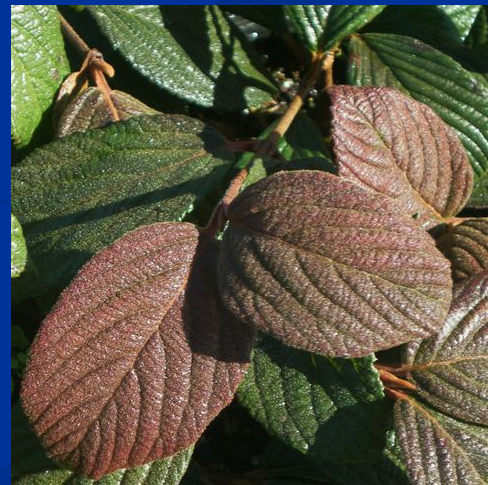
*V. plicatum tomentosum*  
(Doublefile viburnum )



# V. plicatum (Japanese Snowball Viburnums)

- V. plicatum f. plicatum *'Kerns Pink'*
- V. plicatum f. plicatum *Newport*<sup>TM</sup>
- V. plicatum f. plicatum *'Popcorn'*

# V. plicatum f. plicatum '*Kerns Pink*'





*V. plicatum Newport*<sup>TM</sup>



# *V. plicatum Newport*<sup>TM</sup>



# *V. plicatum* 'Popcorn'



# V. plicatum f. tomentosum habit



plicatum tomentosum  
*'Lanarth'*



plicatum tomentosum



plicatum tomentosum  
*'Shasta'*



plicatum tomentosum  
*'Mariesi'*

# Doublefile Viburnums



V. plicatum f. tomentosum  
(Doublefile Viburnum)

- V. plic. f. tom. *Copper Ridges*<sup>TM</sup>
- V. plic. f. tom. 'Igloo'
- V. plic. f. tom. 'Lanarth'
- V. plic. f. tom. 'Shoshoni'
- V. plic. f. tom. 'Summer Snowflake'

V. plicatum f. plicatum  
*Copper Ridges*™



V. plicatum f. tomentosum  
*Copper Ridges*™





V. plicatum f. tomentosum  
*Copper Ridges*™



V. plicatum f. tomentosum  
*Copper Ridges*™



# *V. plicatum* f. *tomentosum* 'Igloo'



*V. plicatum* f. *tomentosum* 'Magic Puff'



V. plicatum f. tomentosum  
*'Summer Snowflake'*



*V. x 'Pragense'*



**V. prunifolium**  
**(Blackhaw Viburnum)**

- *V. prunifolium Forest Rouge* <sup>TM</sup>
- *V. prunifolium Ovation* <sup>TM</sup>

# *V. prunifolium Forest Rouge*™





# V. prunifolium *Ovation*™



*V. rufidulum*  
(Rusty Blackhaw Viburnum)



# *V. rufidulum*



# V. rufidulum



# V. rufidulum



# *V. rufidulum*



*V. sargentii* '*Chiquita*'



# V. setigerum

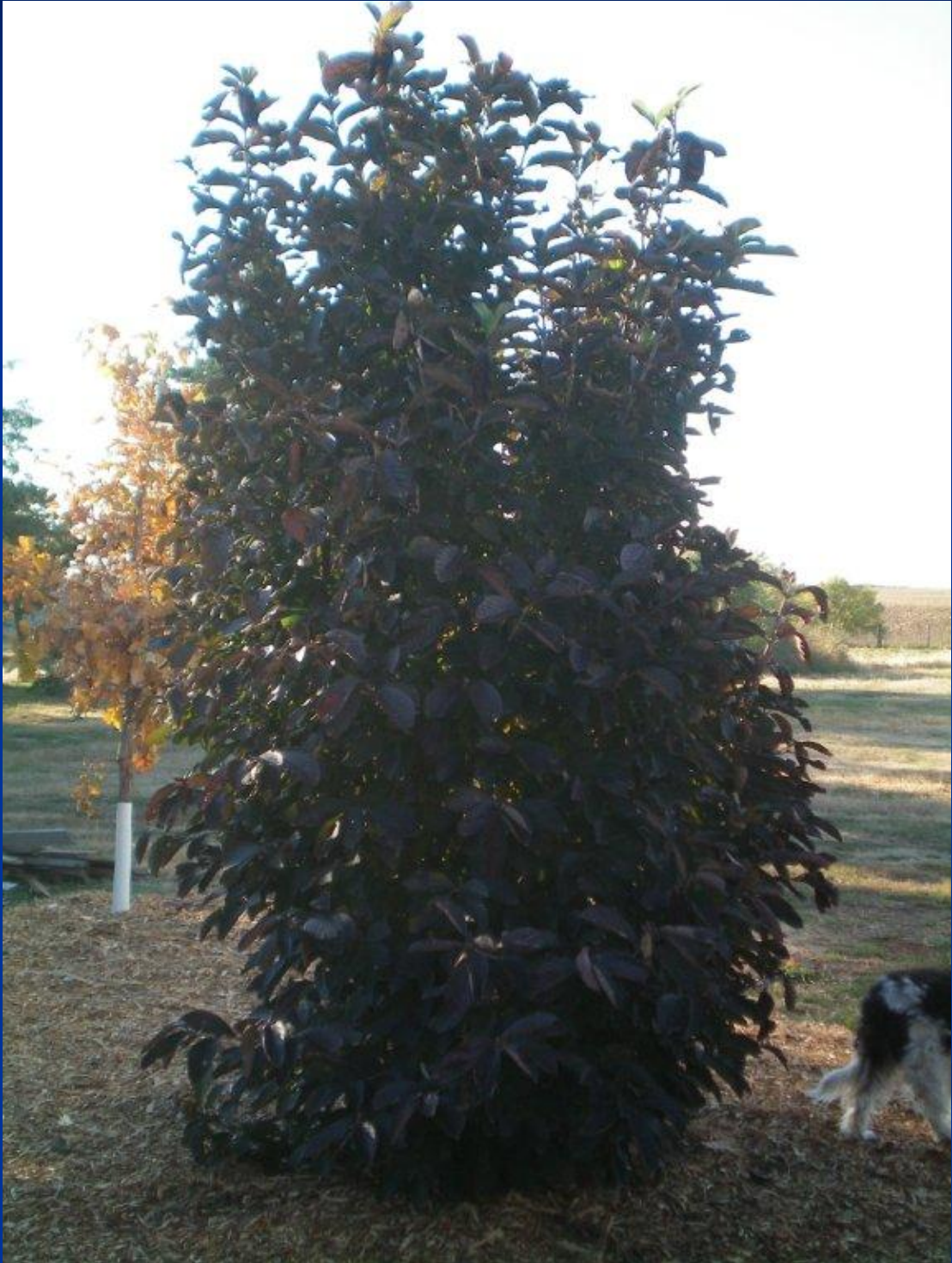




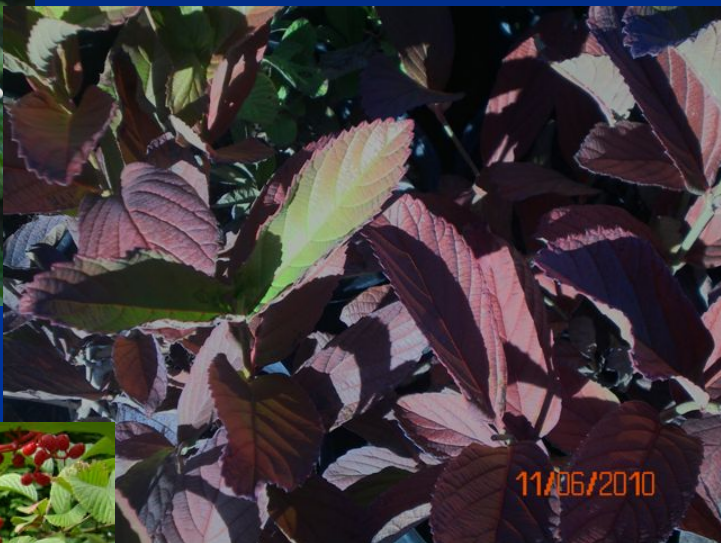
*V. sieboldii* 'Wavecrest'



*V. sieboldii* 'Wavecrest'



# V. sieboldii 'Wavecrest'



# Introducing the 2012 GreatPlants™ release

## V. x 'Prairie Classic'™



# V. x 'Prairie Classic'™



# V. x 'Prairie Classic'™



# V. x 'Prairie Classic'™



# Tree-form V. x Prairie Classic™





# Tree-form *V. prunifolium*



*V. prunifolium*



## Tree-form *V. rufidulum*



# Tree-form *V. sieboldii* 'Wavecrest'



# Tree-form *V. sieboldii* 'Wavecrest'



# Tree-form *V. sargentii* '*Susquehanna*'



Tree-form *V. plic.* f. tom.  
*'Shoshoni'*



Tree-form *V. plic. f. tom.*  
*'Summer Snowflake'*



# Espaliered *V. rufidulum*





# Viburnum hedges/screens

## *V. pragnense*



# Viburnum hedges/screens *V. x rhytidophylloides* cultivars



Viburnum hedges/screens  
*V. x burkwoodii* 'Conoy'



# Viburnum mass plantings *V. x* 'Emerald Triumph'



# V. x 'Susy Dirr'



*V. plicatum* f. *plicatum* *Spellbound*<sup>TM</sup>



*V. rufidulum* 'Prairie Knight'



# *V. rufidulum* 'Prairie Knight'





*V. rufidulum* 'Prairie Knight'



*V. rufidulum* 'Cinnabun'



# V. x 'Nantucket'



# V. x 'Spring Lace'



# V. x Pearlific™



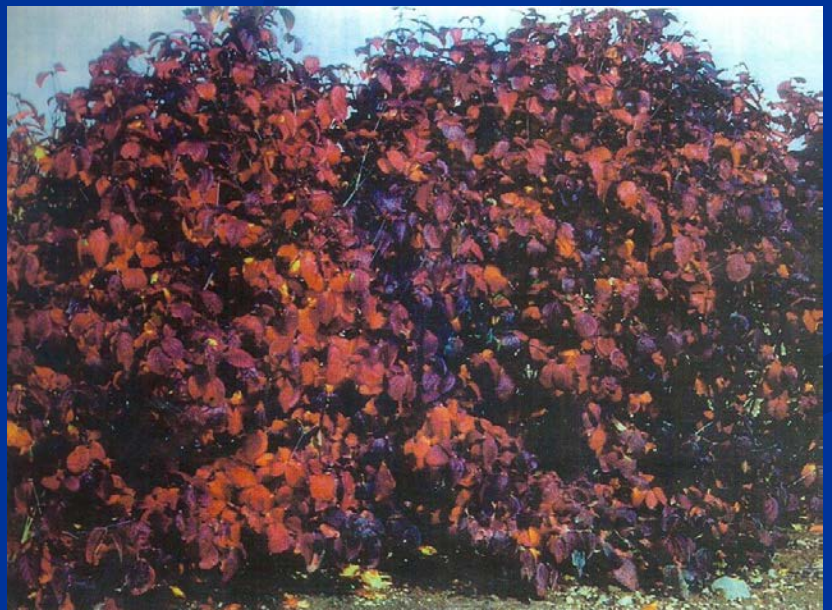
*V. x Pearlfic*<sup>TM</sup>



# *V. rafinesquianum* 'Louise's Sunbeam'



*V. x burkwoodii* *American Spice*™

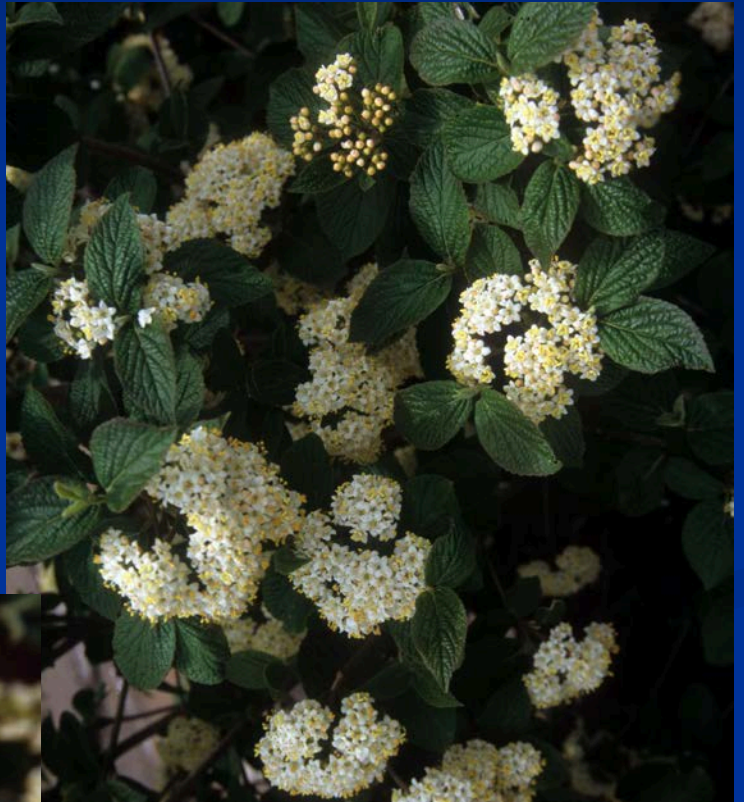




# *V. cassinoides* 'JN Select' Freedom <sup>TM</sup>



# V. x 'Willis' Compact' Emerald Isle™



*V. carlesii* 'Variegatum'

