



Britain's Hidden Treasures: Sea Buckthorn

Aston University, 18 Nov 2008

Varieties & Agronomy

... with a view to UK cultivation

Dr Alan Baylis



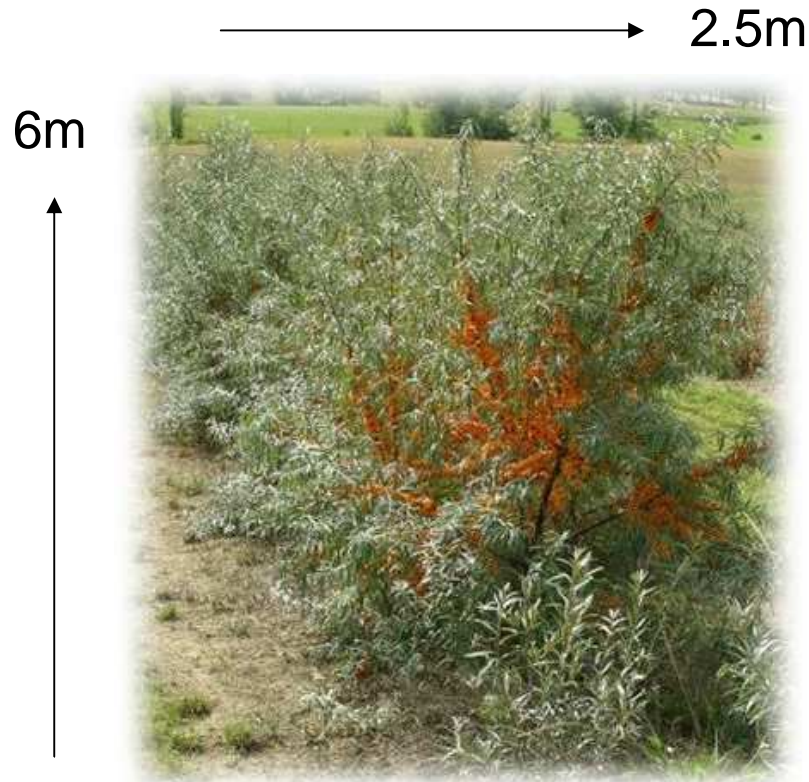
Herbiseed
for specialist seeds

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Plant Profile

Hippophae rhamnoides



- Dioecious: ♀ ♂
- Flowers Apr/May
- Harvest Sept/Oct
- 3 years to bear fruit
- 5-7 years to max yield

Berries ... Vit C (2x-10x citrus) *etc*

Seeds ... linoleic, linolenic

Pulp ... palmitoleic

Leaves ... tannins

Bark ... tannins

Spread by suckers

N-fixing bacteria: *Frankia* sp.



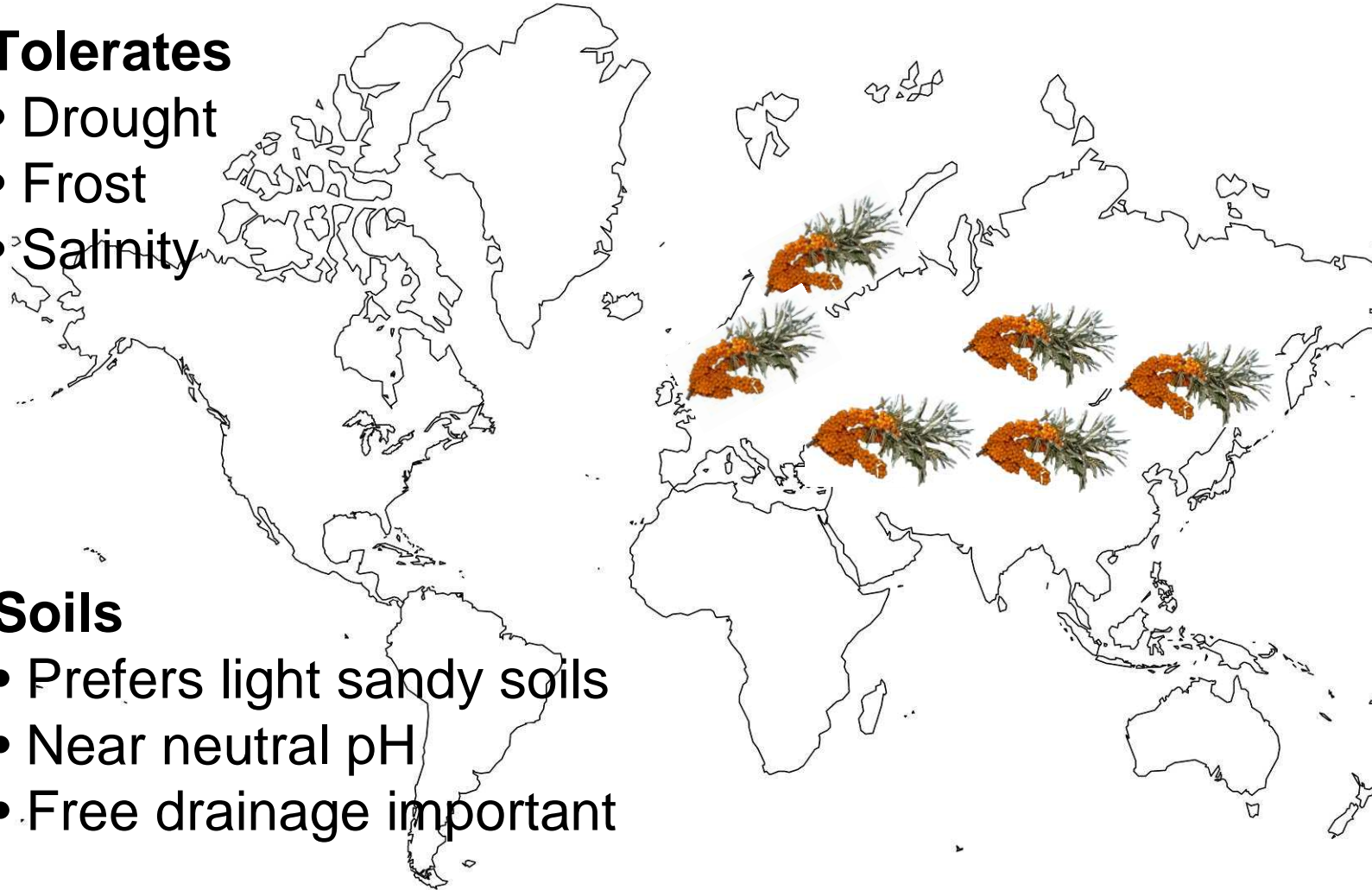
Origins

Tolerates

- Drought
- Frost
- Salinity

Soils

- Prefers light sandy soils
- Near neutral pH
- Free drainage important





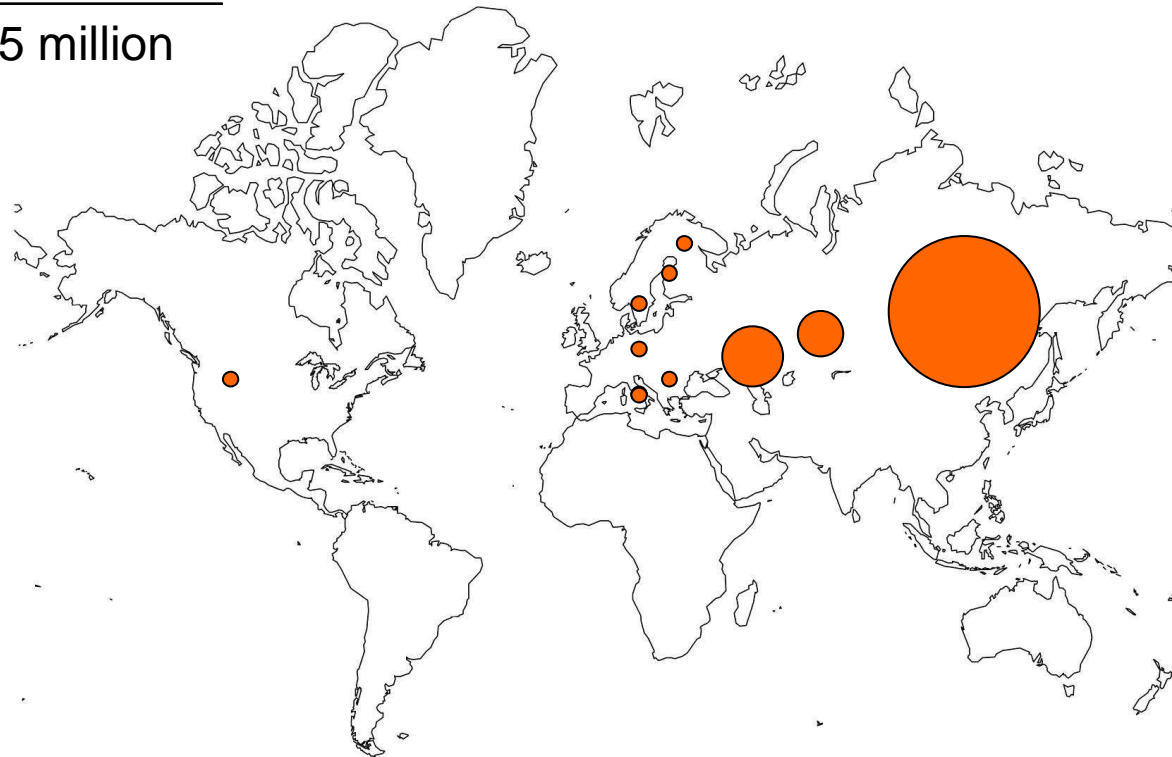
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Cultivation

	Cultivated area (ha)
China	2.2 million/1.5 million
ex USSR	3,000
Russia	2,400
Estonia	700
Germany	250
Finland	220
Canada	180
Romania	180
Italy	50
Sweden	20





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Diversity

- 'Polymorphous species'
- Several 'sub-species'
- Probably '000s of biotypes

- Vitamin C ... x25 range reported
- Carotene ... x5
- Vitamin E ... x2
- Berry oil ... x4
- Seed oil ...x4





Varietal Characteristics

Tree

- Yield ... (up to 23 t/ha equiv noted)
- Winter hardiness
- Flowering time
- Ripening period
- Pest & disease resistance
- Main stem height
- Crown shape, dimensions, branch architecture
- Thorns
- Overall suitability for mechanical harvesting

Fruit

- Quality ... bioactives, oils, minerals
- Weight, shape, colour
- Colour
- Pedicle length & attachment

<http://www.agroforestry.co.uk>

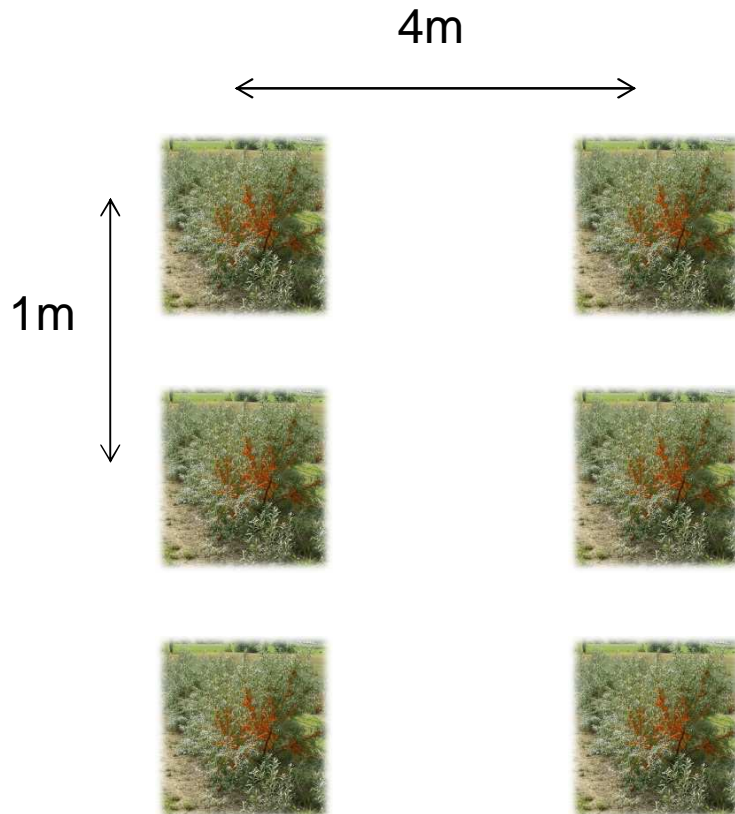
<http://www.cooltemperate.co.uk/>

<http://www.goscote.co.uk/>

<http://www.bridgemere.co.uk/>



Agronomy: Crop Establishment



Control perennial weeds

Plant N-S orientation or along contours

- 2,500 trees/ha
- 85% female:15% pollinator
- Cuttings bear fruit 2 yrs before seeds (grow in nursery)

Probably only phosphate fertilizer needed (120-160 kg/ha)

Train to shape



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Agronomy: Crop Production

- Apply P & K after harvest
- Prune 3 yr wood to rejuvenate
- Pests: Aphids, fruit fly, larvae, deer, birds, rodents
- Diseases: Damping-off fungi, rots, scabs

- Harvesting
 - Berry plucking
 - Grab & shake to loosen ripe berries
 - Beat frozen branches
 - Cut branches by hand
 - Freeze to -40°C
 - Store or separate frozen berries
 - High admixture without careful separation
 - Mechanical harvesting ... strippers & shakers



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Economics

	Price €/fresh kg	Yield Kg/ha	Revenue €/ha
China	0.2	200	40
Germany	2.0	2,290	4,580
Sweden	7.0	750	5,250



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SWOT

Strengths

'Super-berry'

Genetic diversity

N-fixing

Weaknesses

Labour intensive

Difficult harvesting

Long establishment period

Opportunities

Quality assurance

Sustainable Ag

Organic systems

Premium products

Threats

Cheap imports

Annual UK crops



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Key Success Factors

- Select/breed varieties adapted to local conditions
- Capitalise on N-fixation
- Utilise whole plant ... berries, leaves, bark
- Abundant labour
- Mechanise harvesting
- Seek high value products



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Wild herbs ■ Bioactive Plants ■ New Crops