

Growing Hazelnuts in Ontario 101

Propagated nursery stock

Orchard design and weed management

Harvest and post-harvest



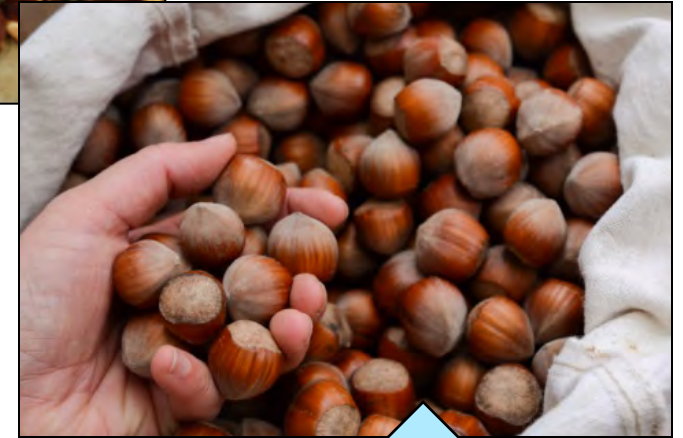
Todd Leuty, Orchard Horticulture and Forestry Specialist
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Guelph, ON
todd.leuty@ontario.ca

Hazelnuts in Ontario wanted : 40,000 acres



Capacity: 6000
tons

On farm storage or Co-op aggregator



March

spring

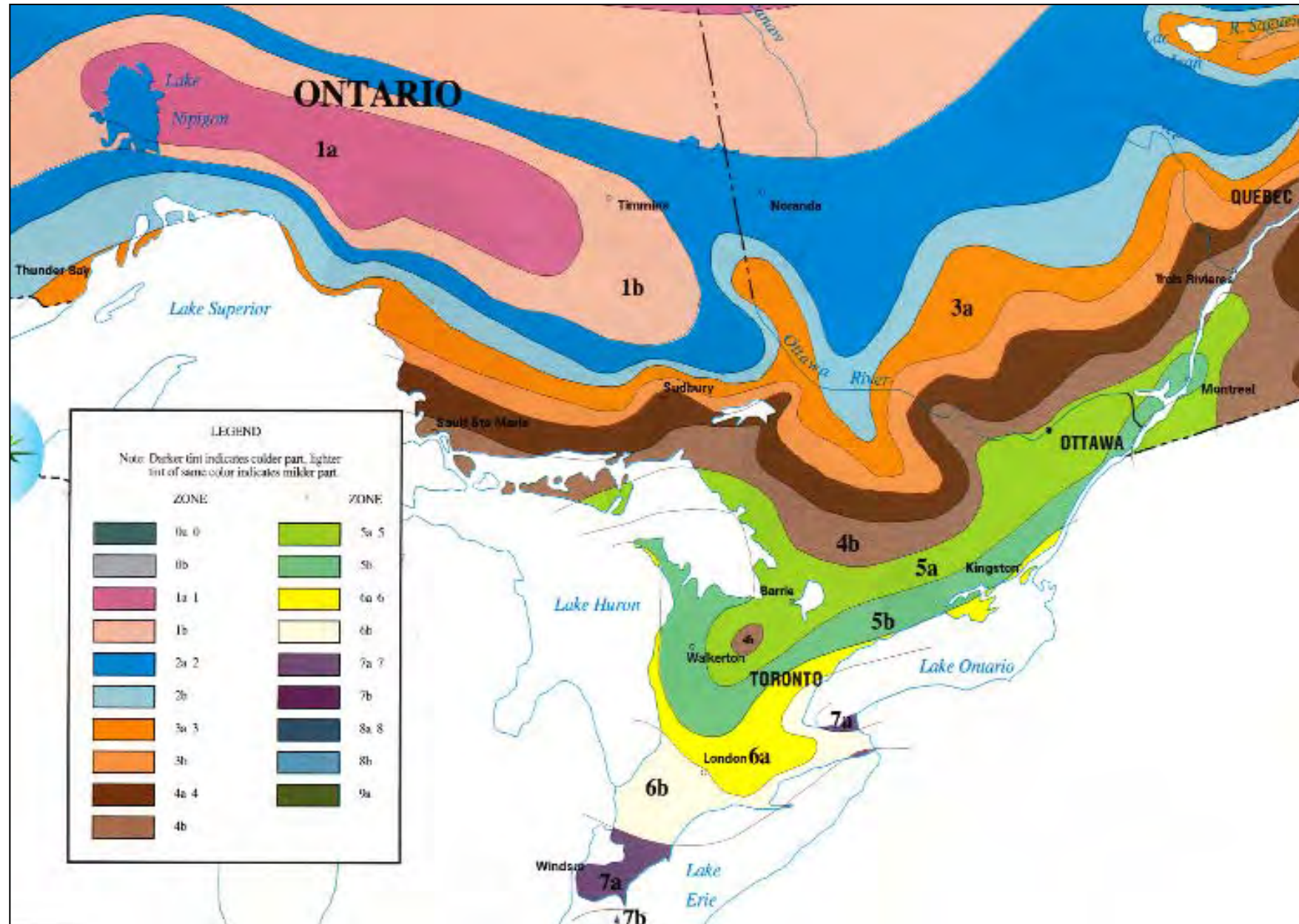
summer

Sept



The hazelnut production cycle

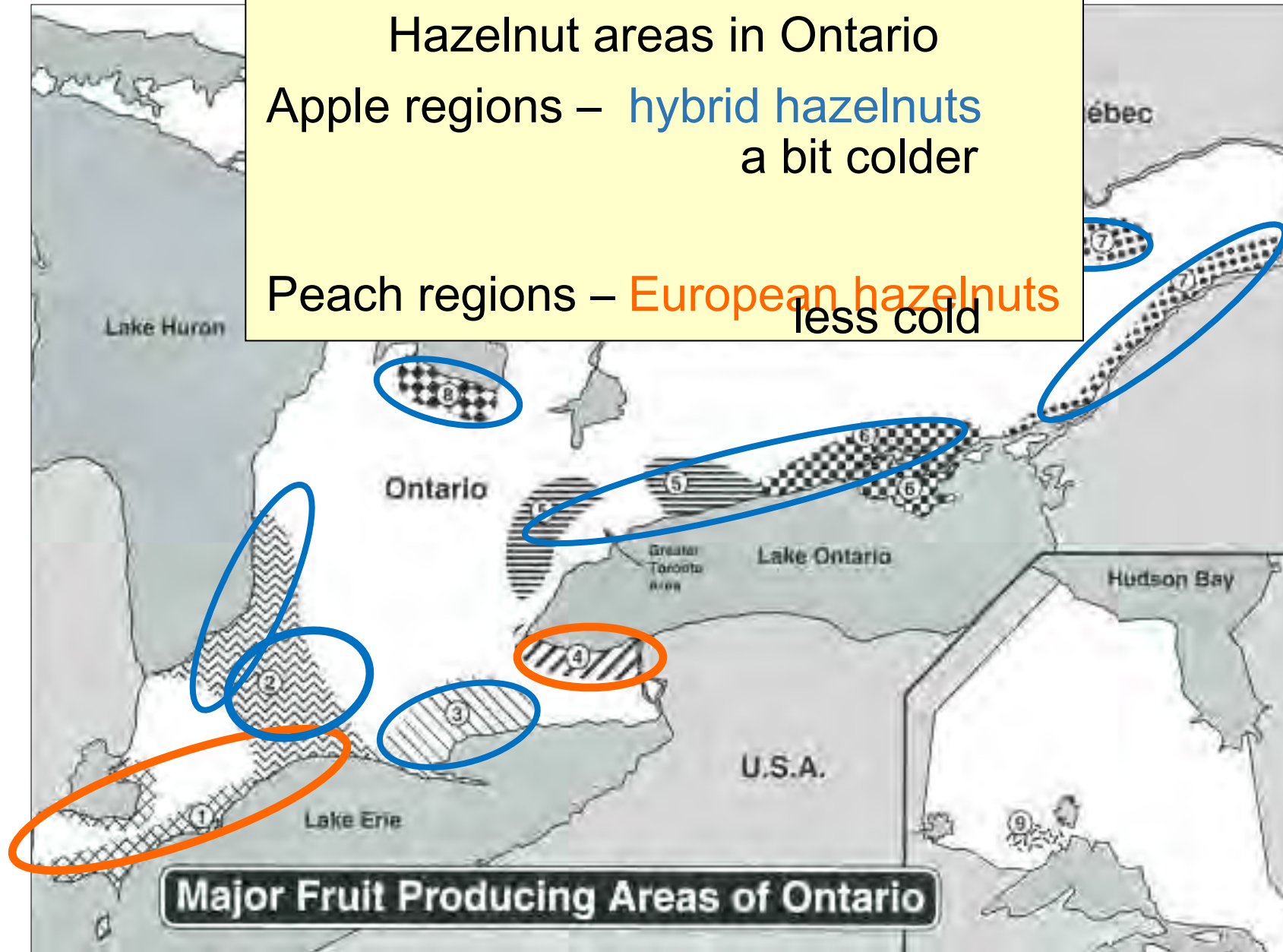
Hardiness Zone Map - Ontario



Hazelnut areas in Ontario

Apple regions – hybrid hazelnuts
a bit colder

Peach regions – European hazelnuts
less cold



Confidence in,

✓ Annual crop
yield & price

✓ Paying the bills

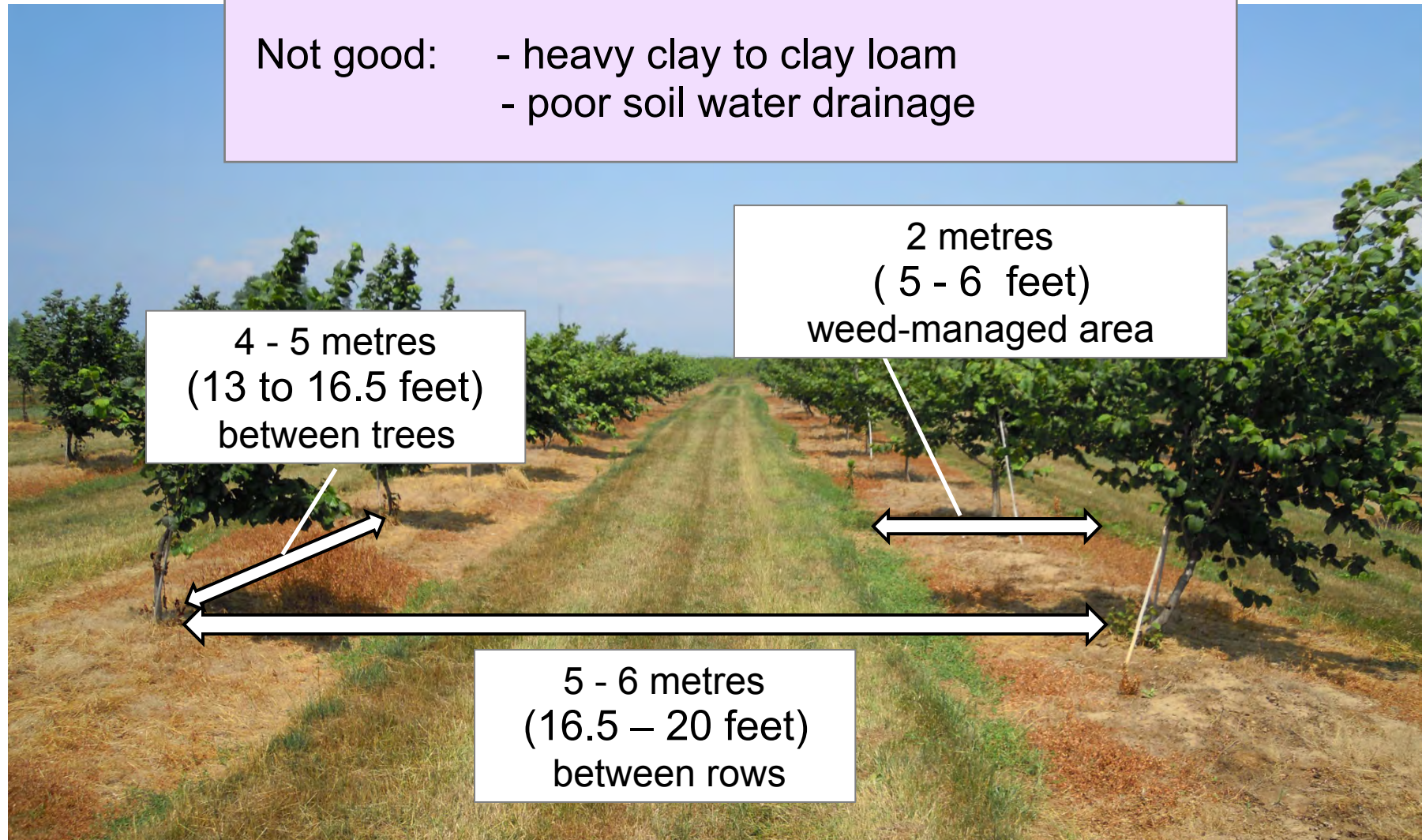
✓ Annual profit



Tree spacing and site guideline: 130 – 220 trees / acre

Ideal site: - well-drained, loam to sandy loam
- gentle southern slope, tile drained

Not good: - heavy clay to clay loam
- poor soil water drainage

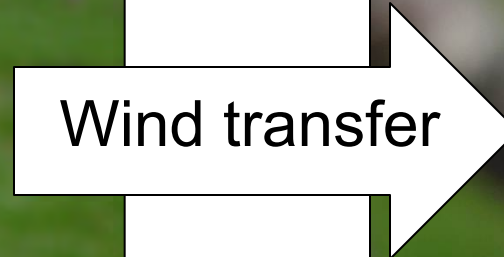


Pollinating hazelnuts

- Hazelnuts require cross-pollination to set a kernel
- Occurs during March. Catkins are susceptible to freezing
- Not all hazelnut pollen is compatible with each crop cultivar
- Must coordinate pollen release with receptive female flowers

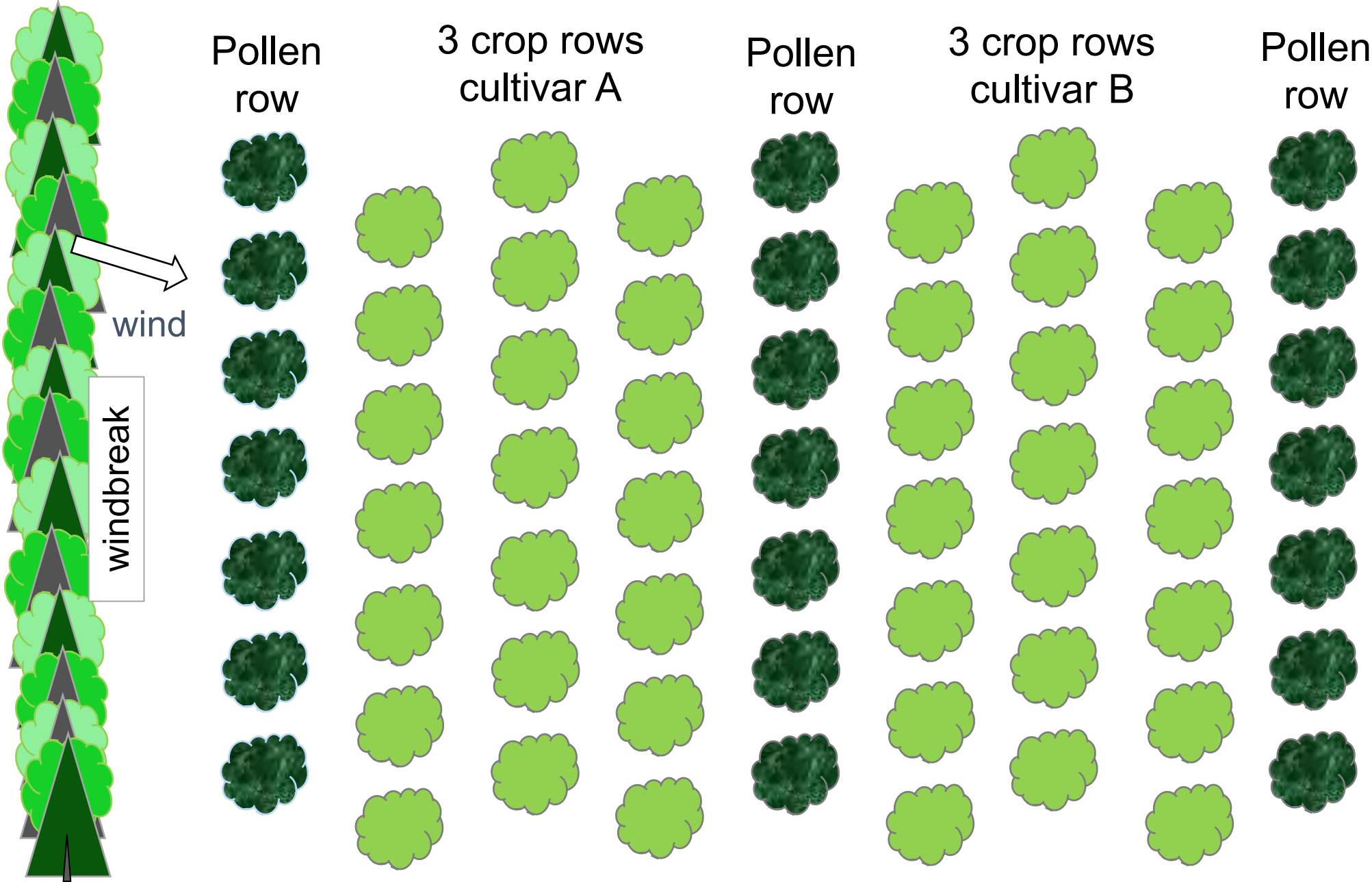


Male 'catkin' flower

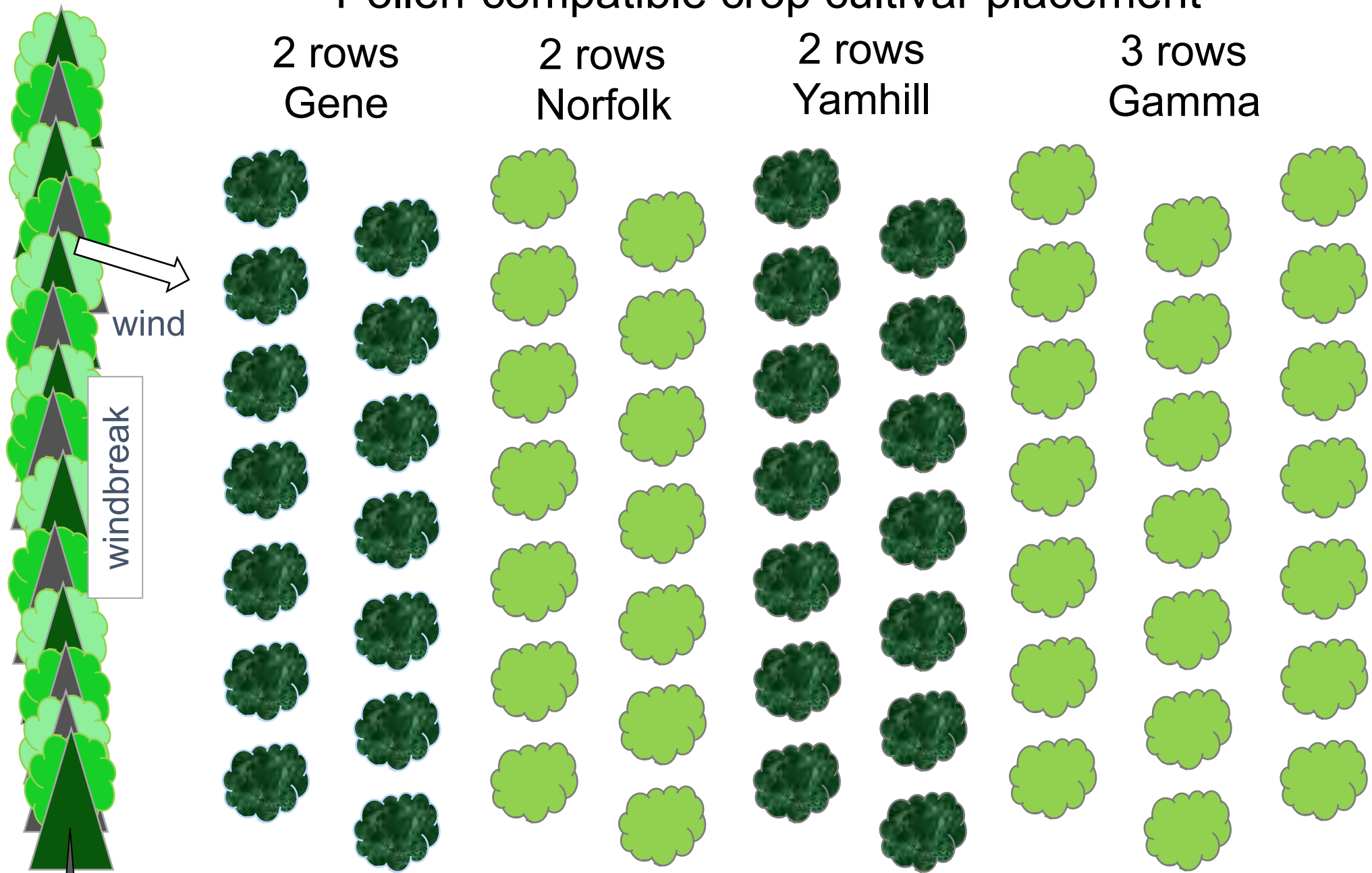


Receptive female flower

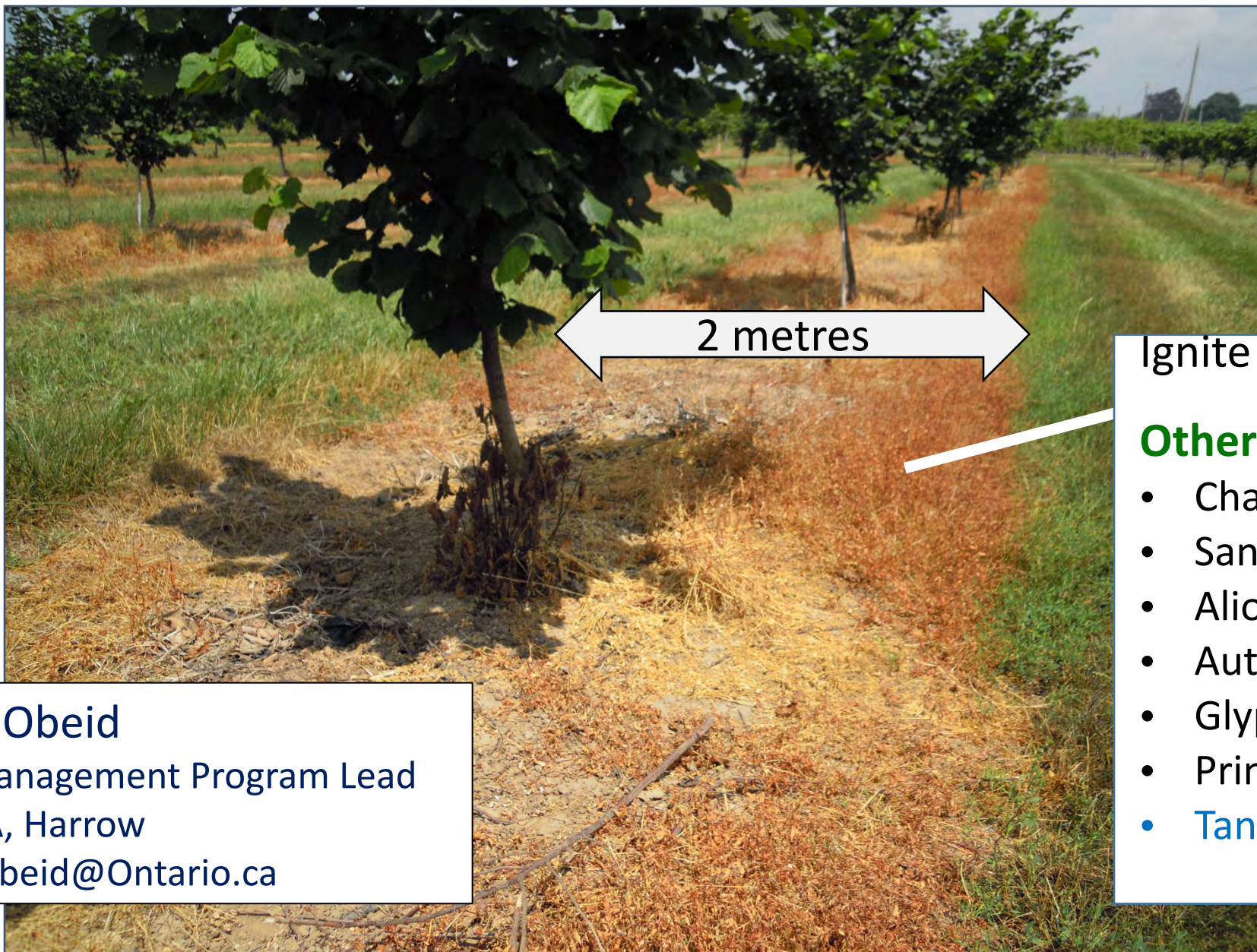
Hazelnut pollen source placement



Pollen-compatible crop cultivar placement



Weed Management



Ignite herbicide

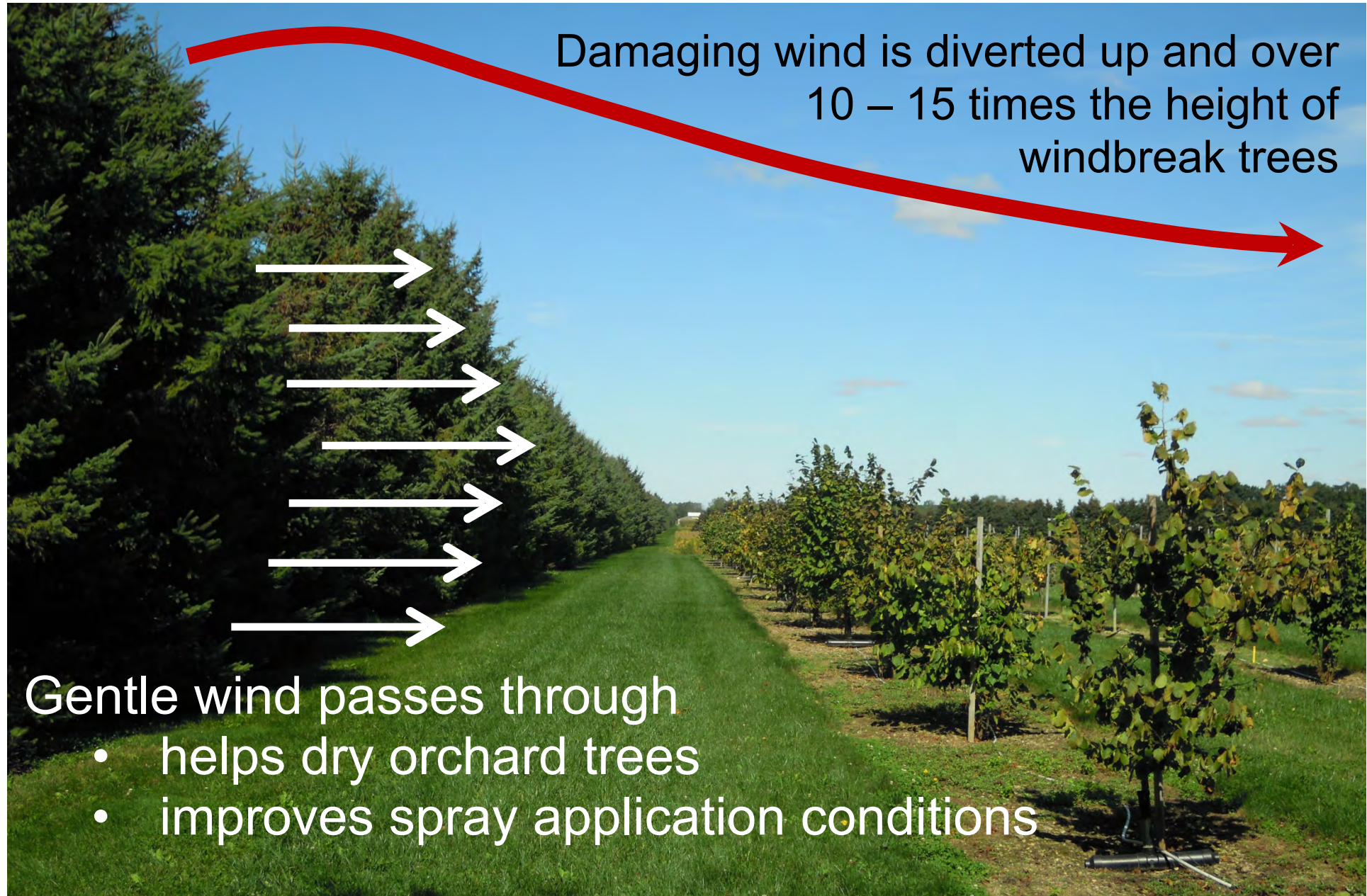
Others

- Chateau
- Sandea
- Alion
- Authority
- Glyphosate
- Princep Nine-T
- Tank mixes

Kristen Obeid

Weed Management Program Lead
OMAFRA, Harrow
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Windbreaks help protect hazelnut orchards



Provisional hazelnut cultivar recommendations (crop and pollen source) for Ontario
Field trials by Dr. Adam Dale and Dr. Toktam Taghavi, University of Guelph

Cultivar and source	Eastern Filbert Blight	Catkin Survival	Fresh market & confectionary	Yield	Hardiness Zone	Pollen Compatible Varieties
Gene	tolerant	good	fresh market	very good	Zone 5 - 7	Slate, Norfolk, Jefferson
Jefferson	susceptible	okay	both	okay	Zone 7	Gene, Gamma, Yamhill
Yamhill	susceptible	poor	both	okay	Zone 7	Gamma, Santiam, Jefferson
Chelsea	tolerant	good	both	good	Zone 5 - 7	Jefferson, Gene
Norfolk	tolerant	good	both	good	Zone 5 - 7	Gene, Jefferson, Slate
Gamma	susceptible	fair	both	good	Zone 7	Jefferson, Yamhill, Santiam, Theta
Slate	tolerant	fair	fresh market	good	Zone 5 - 7	Gene, Norfolk, Lewis
Alex	tolerant	good	both	good	Zone 5 - 7	TBD

New hazelnut cultivars continue to emerge for field testing

Current Provisional recommended

	S alleles
Gene	<u>15</u> , <u>23</u>
Jefferson	<u>1</u> , <u>3</u>
Yamhill	<u>8</u> , <u>26</u>
Chelsea	<u>1</u> , <u>20</u>
Norfolk	<u>12</u> , <u>25</u>
Gamma	<u>2</u> , <u>10</u>
Slate	<u>1</u> , <u>23</u>
Alex	- -
Santiam	<u>3</u> , <u>15</u>
Theta	<u>5</u> , <u>15</u>
Lewis	<u>3</u> , <u>8</u>

Recent Ontario varieties

	S alleles
Carmela	<u>23</u> , <u>25</u>
Cheryl	<u>10</u> , <u>12</u>
Matt	<u>11</u> , <u>13</u>
Linda	<u>14</u> , <u>23</u>

Northern cold hardy varieties (Zone 5)

	S alleles
Aldara	<u>25</u> , <u>27</u>
Marion	<u>14</u> , <u>25</u>
Frank	<u>14</u>
Dawn	<u>15</u> , <u>27</u>
Andrew	- -
Northern Blais	- -
Dermis	- -
Kiara	- -

New Rutgers University breeding trial (Zone 7?)

	S alleles
Raritan	<u>3</u> , <u>22</u>
Monmouth	<u>1</u> , <u>12</u>
Hunterdon	<u>1</u> , <u>3</u>
Somerset	<u>3</u> , <u>10</u>

- Very EFB tolerant
- European cv

Licensed US propagator
www.foggybottom.farm

Cultivars having similar expressed
S alleles will not cross-pollinate

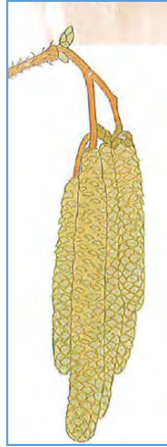
Stages of flowering (male)

Develop a 'maximum pollen' strategy

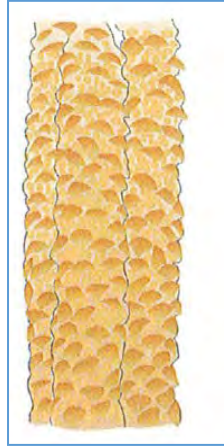
Stage 1



Stage 2



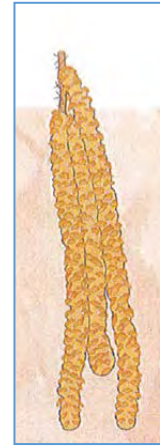
Stage 3



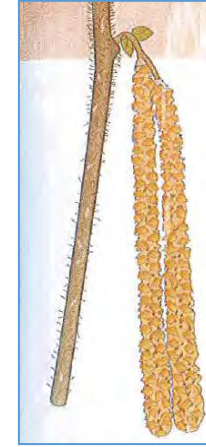
Stage 4



Stage 5



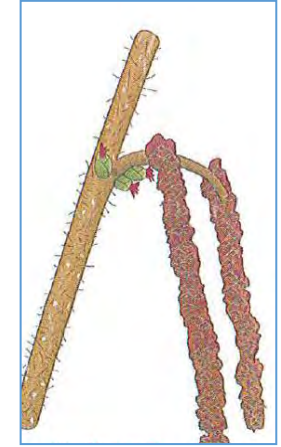
Stage 6



Stage 7

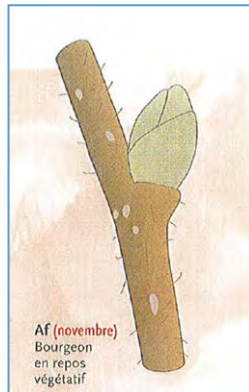


Stage 8



Stages of flowering (female)

Stage 1



Stage 2



Stage 3



Stage 4



Stage 5



Pollen transfer

Where to buy hazelnut trees

Sourcing hazelnut nursery stock for new orchards may be a limiting factor in Ontario – supply capacity is growing – **order early**

Ideal nursery supplier,

- Propagated trees: certified 'true-to-name' cultivars
- Free of disease – eastern filbert blight, bacterial blight
- Nursery guarantee – customer satisfaction

*tolerant &
manageable*

Germinated seeds are clearly labeled as seedlings, not as cultivars

Where to buy hazelnut trees

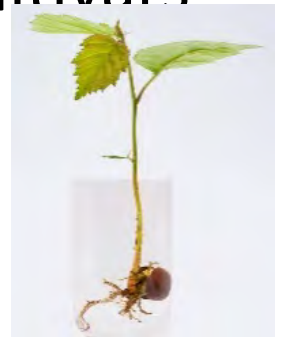
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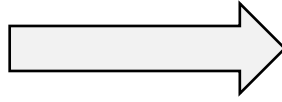
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- ✓ beware of identity theft of named cultivars
- ✓ no written guarantee





Cost of
establishment

- Management of weeds, groundcover, irrigation
- Soil & leaf tissue testing, soil nutrition

Intercropping in Orchard Horticulture


- ✓ Intercrops add complexity
- ✓ May be profitable during orchard establishment



Hazelnuts = No income
for 4 to 5 years

Alleys = annual income
for 3 to 4 years

Pest Control Products are strictly federally regulated



Herbicides, insecticides and fungicides are registered for 'non-bearing' hazelnuts

Herbicides, insecticides and fungicides are registered for the alley crop

Hand hoe
first year

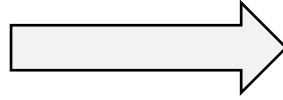
Ontario hazelnuts – second year – soybean intercrop

Orchard
intercropping

Windbreaks
conifer & deciduous

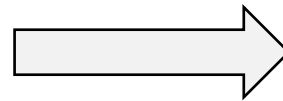
Martin Hodgson
Norfolk County





Cost of
establishment

- Management of weeds, groundcover, irrigation
- Soil & leaf tissue testing, soil nutrition



Cost of
production

- Annual crops, food safety & quality, income \$
- Irrigation, insecticides, fungicides, herbicides



Hazelnut harvester and cracking machine



Hazelnut harvester and cracking machine



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End

Thank you

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