



# Hazelnut basics



## Hazelnut 101 – the basics

This will be a very quick overview of:

### ***The world of hazelnuts:***

- Designed to fill in some of the information gaps you may have
- Describe hazelnuts and how they grow
- Give you some hazelnut statistics & math
- Review some of the useful references available
- Explain why hazelnut have not been commercially grown before in this area



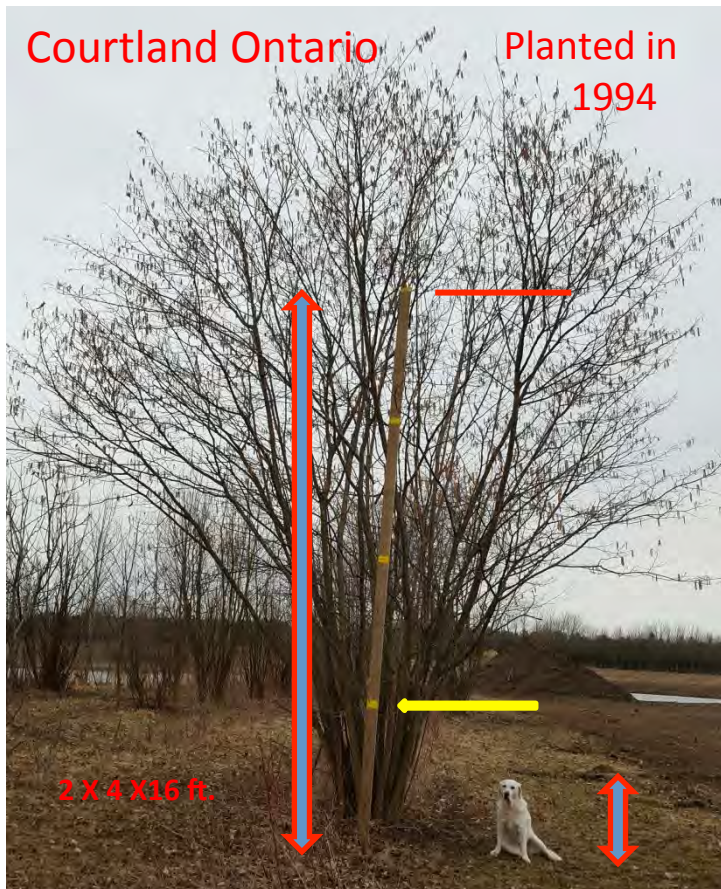
## Hazelnut 101 – the basics

- Proper name is *Corylus avellana*
  - AKA Filbert or cobnut
- Round to oval in shaped shells  
15-25 mm long X 10-25 mm dia.
- Grow as low trees when pruned to single stems reaching heights over 20 ft. (6m)
  - They love to sprout from the base
- Tree heights vary depending on soil conditions

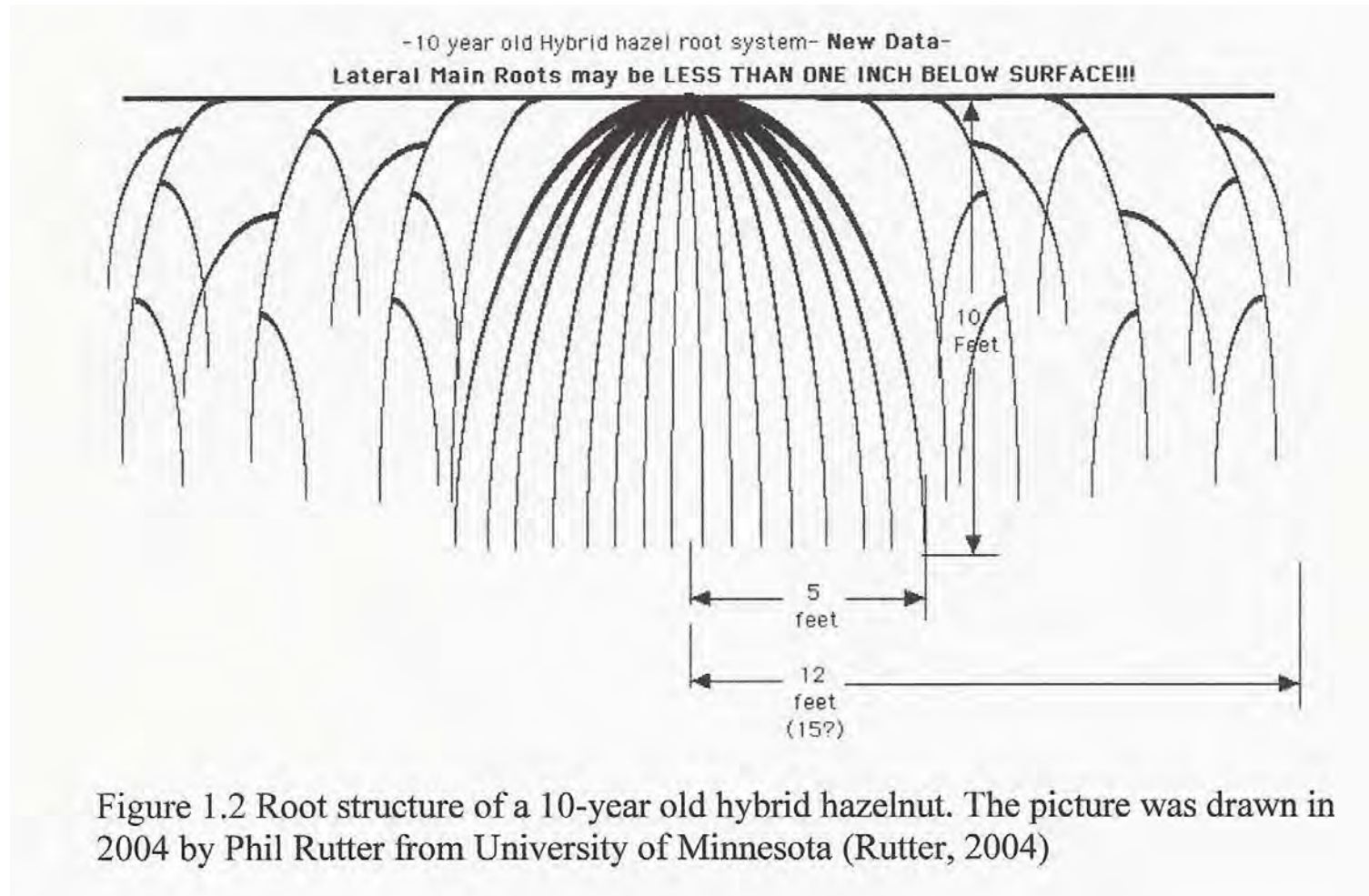




## Hazelnut 101 – the basics









## Hazelnut 101 – the basics

- Hazelnuts have both male and female parts but are not self fertile
- Nuts are a hybrid cross between the two parents and will carry a mix of both parents' genes forward
- Selected varieties are reproduced by cuttings, stooling and tissue culture
- Grafting onto select root stocks works but can be problematic due to root stock sprouting



## **Hazelnut 101 – the basics**

- In other warmer growing areas hazelnuts tend to pollinate from December through to March
- There is a need for early, mid and late season pollinators in these regions as the flowers vary their times of opening up throughout this period
- In our area the male catkins and female flowers tend to all open just after the frost leaves the ground, usually early April in Zone 6
- This usually carries on for about 7 to 14 days until a killing frost (-7 C) burns off the catkins and flowers





## Hazelnut 101 – the basics







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- A frost does not normally harm the fertilized hazelnut seed as it remains protected fully within the bud
- The bud then waits until warmer weather arrives before it opens up and starts sending out some leaves and a short branch 3-6 in. long
- The nuts start to form at the end of this branch in early June
- The actual nut meat starts to fill from the tip in early July
- The nut fill is usually complete by mid-August
- Nut drop usually occurs from early to late September







## Hazelnut 101 – the basics

- In commercial orchards the hazelnuts are swept into windrows running down the center of the row between the trees
- A harvester sweeps them up, removing most of the husks and leaves, and then dumps them into a follower wagon or tote.
- Typically the harvested nuts are taken to the consolidator where they are washed, sanitized and dried.
- The nuts are sized/sorted then cracked shortly before roasting to preserve the flavour



## Hazelnut 101 – the basics







## Hazelnut 101 – the basics

- Major production is in Turkey, mid-east and Mediterranean
- In North America it is in the West Coast USA –Oregon and Washington with a small amount in BC
- Now for the math bit!

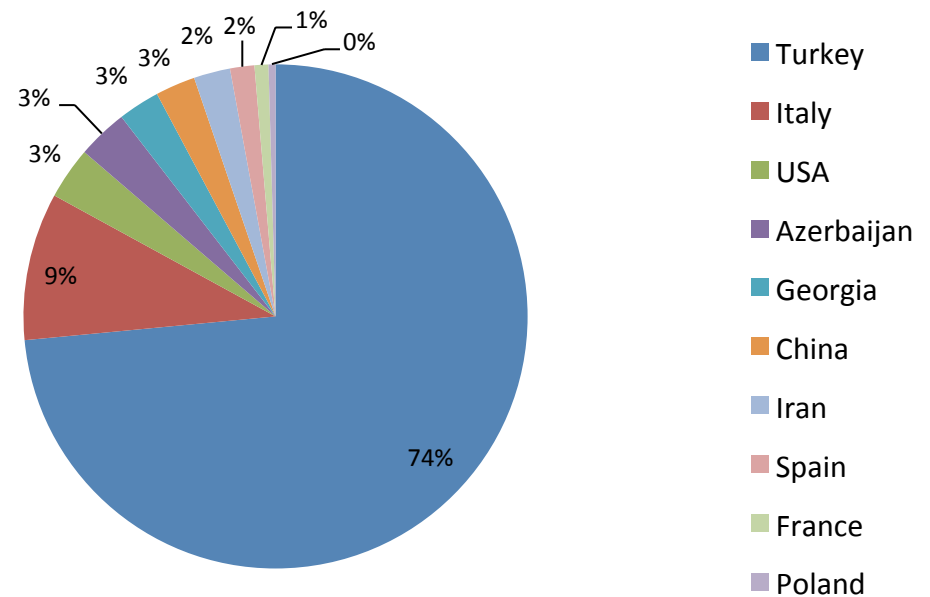


# Hazelnut 101 – the basics

Country	Tonnes
Turkey	660
Italy	85
USA	30
Azerbaijan	29
Georgia	24
China	23
Iran	21
Spain	14
France	8
Poland	4

~\$100M

World production of Hazelnuts by Country







## Hazelnut 101 – the basics

Table 1.1 Main producing countries: variation of acreage (ha) and production (in shell) from the triennium 1995-1997 through to the triennium 2005-2007 (t) and from 1998 through to 2007 (ha)

Country	Production		Cultivated area		
	2005-2007 (000t)	2005-2007/ 1996-1998 (%)	2007 (000ha)	2007/1998 (%)	
Turkey	563	+17	400	+20	1,000,000 A
Italy	120	+4	68	-1	
USA	32	+28	12	-5	30,000 A
Azerbaijan	28	+193	17	+1	
Spain	22	+42	20	-30	
Iran	18	+49	20	+96	
Georgia	16	+6	8	-4	
China	14	+31	9	+6	
Other <sup>1</sup>	20	+24	14	+12	
World	832	+19	567	+14	



## Hazelnut 101 – the basics

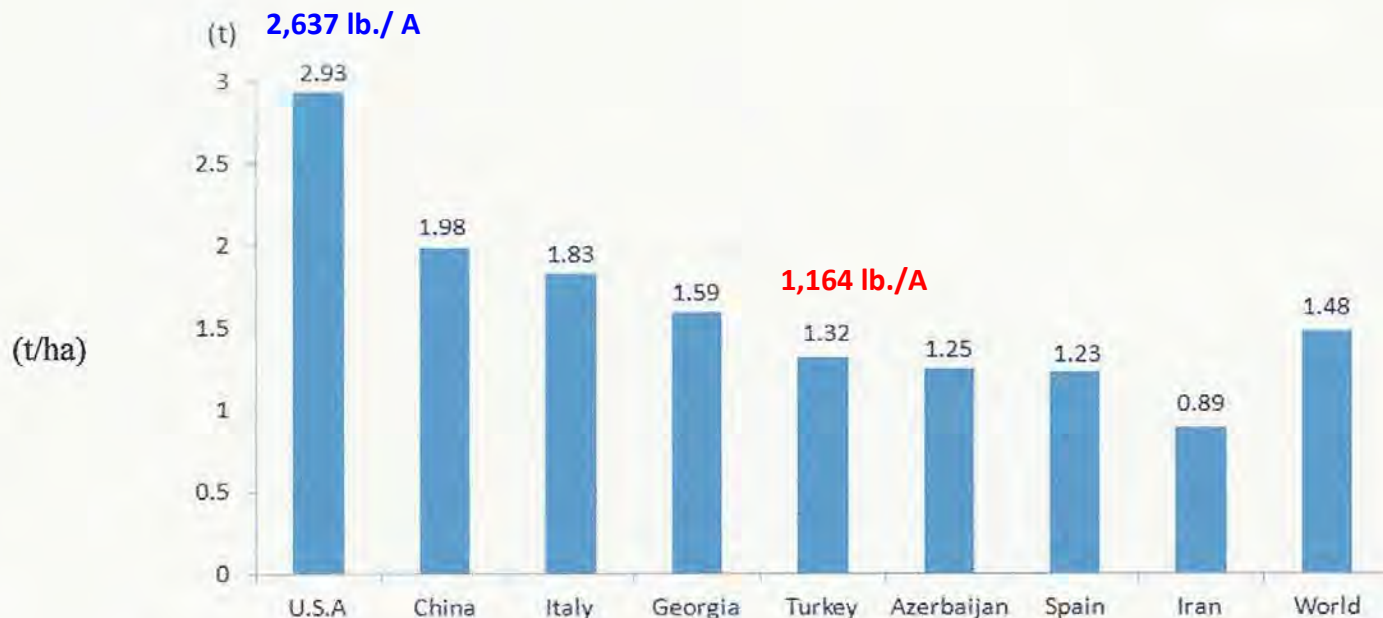


Figure 1.1 Mean hazelnut yield tonnes per hectare in the world and eight main producing countries during year 2004 - 2006

Source: Fideghelli and De Salvador, 2009, compiled data from FAO



# Our main competition

Turkish post harvest processing and drying



AWD





## **Hazelnut 101 – the basics**

- Ferrero's plant in Brantford consumes ~ 10,000 tonnes (22 M lb.) of shelled Turkish hazelnuts a year
- Assuming a yield of 2000 lb./ A., this equates to ~ 27,500 A. of in-shell nuts @ 40% yield
- A further 12,500 to 15,000 A. (5-6000 ha) of hazelnuts are imported into Ontario annually
- Totals ~42,000 A. of land needed to fill current needs in ON



## Hazelnut 101 – the basics

- At an average of 2,000 lb./ A yield = 84 million lb.
- At \$1.50 per lb = \$126 million/ year
- 20 A farm = 40,000 lb = \$60,000 per year

Average gross return on Norfolk sand for 100 acres

- Corn = 120 bu. /A @ \$5.00/ bu. = \$60,000
- Soy beans = 35 bu./ A @ \$10/bu. =\$35,000



## Hazelnut 101 – the basics

- How much to just get started
- Trees will cost about \$15 each
  - At 268 trees/ A = \$4,020
- Irrigation about \$1,000 per acre
- Land preparation and planting ~\$500 to 1,000
- Close to \$6,000 per acre
- Once for a life time (\$200/yr./30yrs)





## Hazelnut 101 – the basics

- Why do we not see hazelnut orchards in Ontario or even Eastern North America?

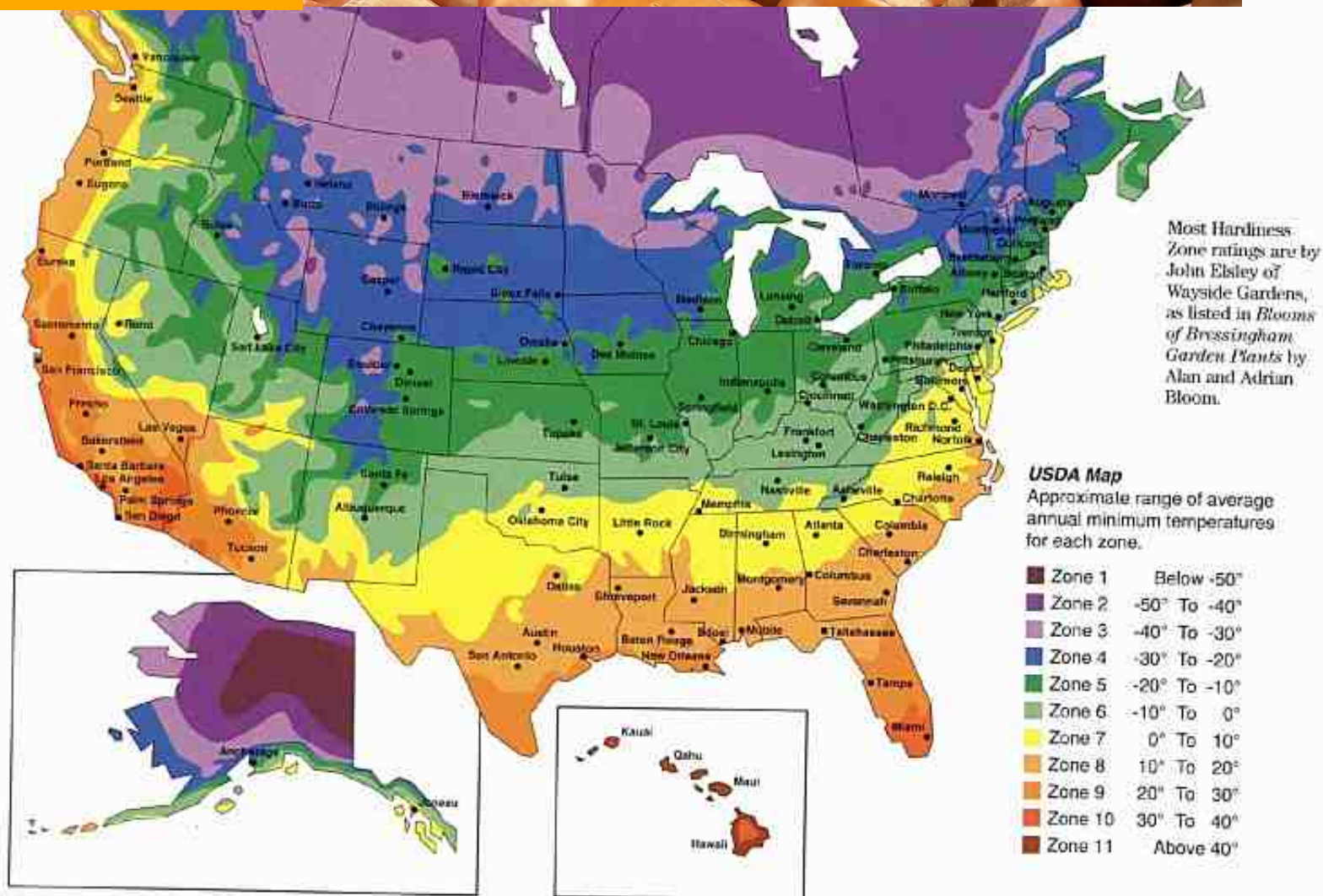
# EFB

- Eastern Filbert Blight
- A fungus that will kill a hazelnut tree in about 5-8 years after infection
- You can spray for it with some effect, chose immune varieties and save a lot of work

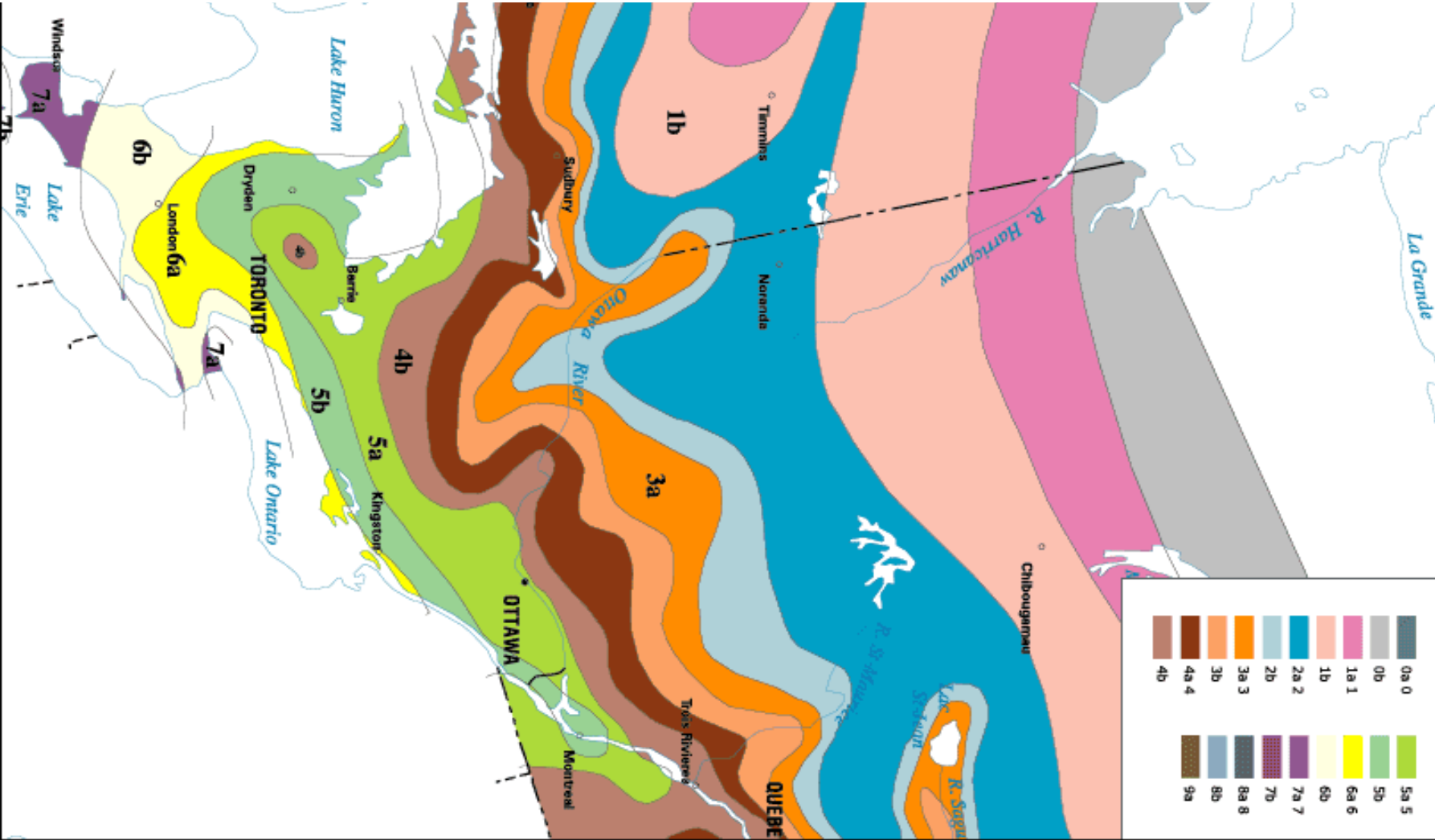


## **Hazelnut 101 – the basics**

- Oregon State University (OSU) is the center for research and development of immune hazelnut varieties
- A number have been developed for the milder climate in Oregon
- Some appear to survive in Zone 7 and 6 in SW ON
- U of Guelph Simcoe research station has an extensive test planting of OSU varieties and others.
- Suitable selections have been made









## Hazelnut 101 – the basics

### Machinery needs

- Use much of your existing equipment such as tractors/loaders, mowers, flails, sprayers, etc.
- Need specialized sweepers and harvester
- Each run about \$50,000 new US\$ from west coast area
- Used they run \$5-15,000 in good condition
- Approximate harvest time per 10 A. per yr. = 3-4 days



## **Hazelnut 101 – the basics**

- Initially there will be either custom harvesters or groups of close by farmers that work together
- Perfect opportunity for start up manufacturers of this specialized equipment
- Old tobacco kilns could be converted into driers



# List of Publications 1

- Ontario Pub. 360 Guide to Fruit Prod'n

- Registered Insecticides & Pesticide

Pub. 75 Guide to Weed Control

- Registered Herbicides

## **Hazelnuts in Ontario – Pests**

[www.omafra.gov.on.ca/english/crops/facts/12-009.htm](http://www.omafra.gov.on.ca/english/crops/facts/12-009.htm)

## **Hazelnuts in Ont. – Growing, Harvesting & Food Safety**

[www.omafra.gov.on.ca/english/crops/facts/12-011.htm](http://www.omafra.gov.on.ca/english/crops/facts/12-011.htm)

## **Bacterial Blight in Hazelnuts**

[www.omafra.gov.on.ca/english/crops/hort/news/hortmatt/2015/19hrt15a3.htm](http://www.omafra.gov.on.ca/english/crops/hort/news/hortmatt/2015/19hrt15a3.htm)

# List of Publications 2

- **Oregon - Nut Growers Handbook**
  - [www.oregonhazelnuts.org/growers-corner/grower-handbook/](http://www.oregonhazelnuts.org/growers-corner/grower-handbook/)
    - Orchard Design Plant Density and Design**
      - <https://catalogue.oregonstate.edu/em9077>
    - **Nut Nutrition –**
      - Growing Hazelnuts in the Pacific Northwest
    - <https://catalogue.extension.oregonstate.edu/em9080>
  - **The Costs and Returns of Establishing & Producing Hazelnut in the Willamette Valley Oregon**
    - **-EM 8748-3 Revised June 2008**

# List of Publications 3

- **SONG**            **Establishing a Nut Orchard**  
» [www.songonline.ca/establishing\\_orchard.htm](http://www.songonline.ca/establishing_orchard.htm)
- **Wikipedia**            **Hazelnut**
- *Hybrid Hazelnut Fertilization*
  - *Lois Braun    U of Minnesota*
  - *http--midwesthazelnuts.org-assets-files-*  
*Fertilizing*  
*%20Hazelnuts.pdf*



Ontario		<b>Pub. 360 Guide to Fruit Prod'n</b>
		•Registered Insecticides & Pesticide
		<b>Pub. 75 Guide to Weed Control</b>
		•Registered Herbicides
		<b>Hazelnuts in Ontario – Pests</b>
		<a href="http://www.omafra.gov.on.ca/english/crops/facts/12-009.htm">www.omafra.gov.on.ca/english/crops/facts/12-009.htm</a>
		<b>Hazelnuts in Ont. – Growing, Harvesting &amp; Food Safety</b>
		<a href="http://www.omafra.gov.on.ca/english/crops/facts/12-011.htm">www.omafra.gov.on.ca/english/crops/facts/12-011.htm</a>
		<b>Herbicide Evaluations for Hazelnuts in Ontario</b>
		R.E. Nurse, AAFC Harrow, M. Filotas, T. Leuty, K. Obeid, OMAFRA
		<b>Bacterial Blight in Hazelnuts</b>
		<a href="http://www.omafra.gov.on.ca/english/crops/hort/news/hortmatt/2015/19hrt15a3.htm">www.omafra.gov.on.ca/english/crops/hort/news/hortmatt/2015/19hrt15a3.htm</a>
Oregon -		<b>Nut Growers Handbook</b>
		<a href="http://www.oregonhazelnuts.org/growers-corner/grower-handbook/">www.oregonhazelnuts.org/growers-corner/grower-handbook/</a>
		<b>Orchard Design Plant Density and Design</b>
		<a href="https://catalogue.oregonstate.edu/em9077">https://catalogue.oregonstate.edu/em9077</a>
		<b>Pest Management Guide for Hazelnuts in the Willamette Valley, OSU Extension Bulletin EM 8328</b>
		<b>-Nut Nutrition –</b> -Growing Hazelnuts in the Pacific Northwest <a href="https://catalogue.extension.oregonstate.edu/em9080">https://catalogue.extension.oregonstate.edu/em9080</a>
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U of Minnesota		<b>Hybrid Hazelnut Fertilization</b>
		–Lois Braun U of Minnesota – <a href="http://midwesthazelnuts.org/assets/files/Fertilizing%20Hazelnuts.pdf">http://midwesthazelnuts.org/assets/files/Fertilizing%20Hazelnuts.pdf</a>
Wikipedia		<b>Hazelnut</b>



1/22/2008