ISHS International Cherry Symposium 2013

TASMANIAN INSTITUTE OF AGRICULTURE

7th cherry international SIMPOSIUM

IHC 2014 Brisbane

Attendance and presentation at the symposium has been funded by HAL using voluntary contribution, the cherry industry levy and matched funds from the Australian Government

HAL Horticulture Australia

UTAS

TIA is a joint venture of the University of Tasmania and the Tasmanian Government

Tasmania Explore the possibilities

PLASENCIA 2013

The symposium was organized by the International Society for Horticultural Science **(ISHS)** and the Government of Extremadura through the Department of Horticulture of the Research Center La Orden-Valdesequera House, and the Department of Fruits and Vegetables of the Agrifood Technology Research Institute of Extremadura, in collaboration with the University of Extremadura.

TOPICS

1. Breeding, Genetics and Biotechnology
2. Crop Production and Orchard Management
3. Rootstocks and Varieties Evaluation/Propagation
4. Tree Fruit Physiology, Plant Growth, and Floral Biology
5. Pest and Disease Management
6. Postharvest Technology, Fruit Quality, Health Related Issues

BREEDING, GENETICS AND BIOTECHNOLOGY

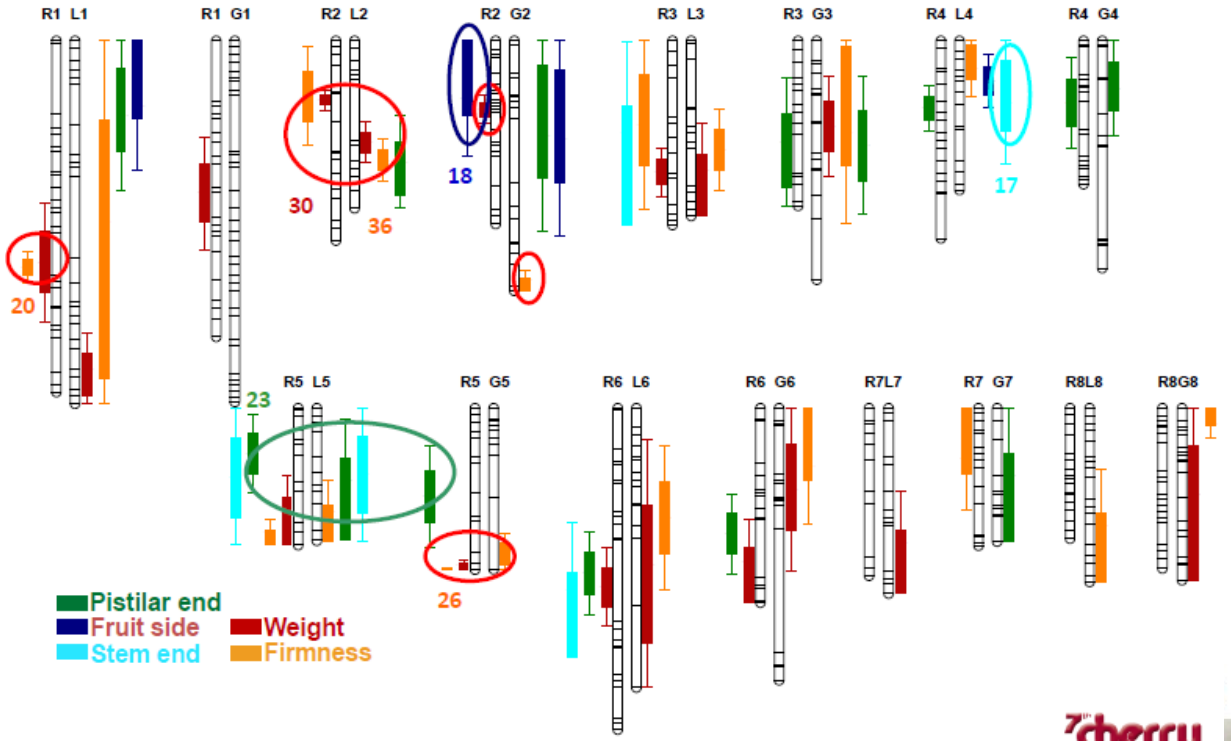
Professor Greg Lang (MSU)
Trends and characteristics of current, new and future cherry cultivars

What's driving breeding programs?
Focus on additional cultivar traits
What traits will become more important in the near future?
Engage physiologists and horticulturalists
Identification of visionary traits



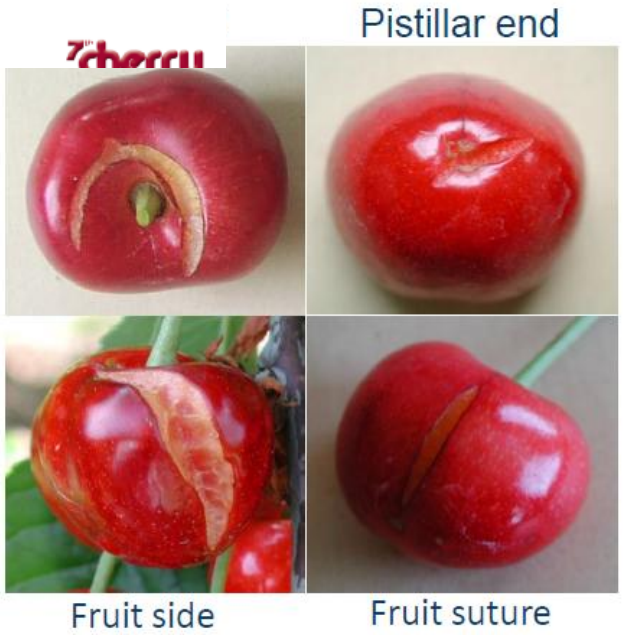

Is your program pursuing any specific traits or goals beyond the foundational cherry breeding traits?

Resistance to cherry leaf spot; very late bloom for frost avoidance adaptation to new harvest systems (upright harvesters require low suckering and moderatetree structure, and sideways harvesters are best with moderate suckering and small flexible stems), resistance to powdery mildew and bacterial canker; low fruit pedicel retention for mechanical harvest; self-fertility, adaptation to low chilling (using interspecific hybrids); resistance to heat-induced fruit doubling; very early ripening; self-fertility, adaptation to low chilling, early ripening, resistance to cherry leaf spot, hybrids with P. canescens and P. tomentose, long on-tree ripening window, precocity and high productivity on vigorous rootstocks, uniform balanced spur formation, good postharvest traits; blush-type fruits (yellow with red blush), novelty fruit types, self-fertility, pest and disease resistance, tree and bud winter hardiness, winter hardiness, compact growth, adaptation to Jerte valley, adaptation to “climate change” (low chilling but high heat for good bud break,but not too early); future targets likely to be resistance to Monilia, Pseudomonas, and black cherry aphid, compact habit, self-fertile, diverse colors, low infection by black cherry aphid, white flesh, low acid, high sugar, adaptation to Beijing climate, self-fertile, tolerance to rain, adaptation to low chill and hot summers, low chilling (<600 hr),early ripening, fruit/leaf balance, good postharvest traits, adaptation to low chilling and high summer heat, early ripening, good postharvest traits, low chilling, long postharvest performance, resistance to bacterial canker



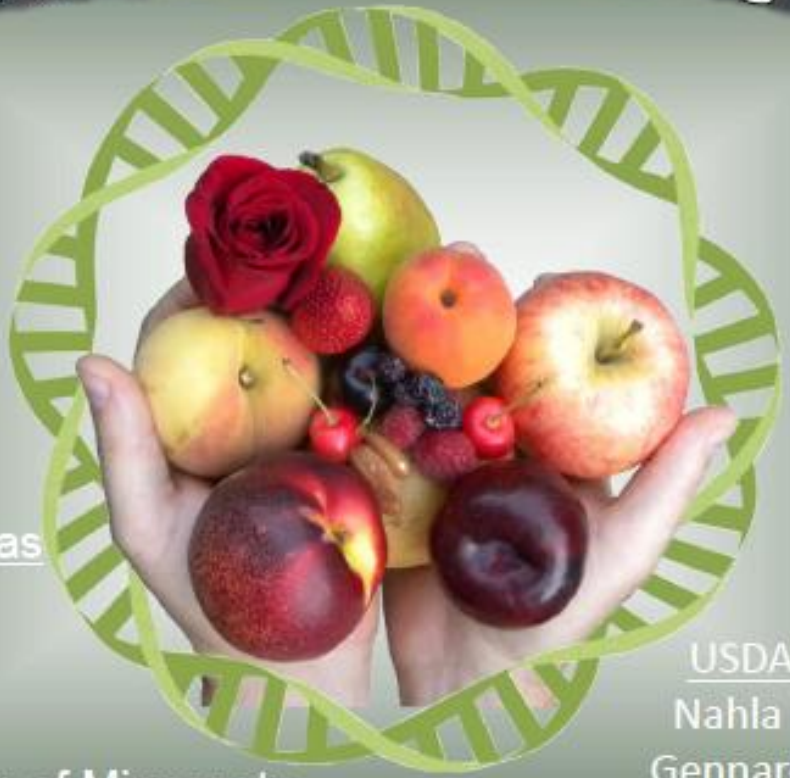
INRA

New breeding programme and new scientific project: ‘Adaptation of sweet cherry to climate change’. Two main targets: phenology-related traits and tolerance to rain-induced fruit cracking



RosBREED

Enabling marker-assisted breeding in Rosaceae



MSU
Amy Iezzoni (PD)
Jim Hancock
Dechun Wang
Cholani Weebadde

Univ. of Arkansas
John Clark

WSU
Cameron Peace
Dorrie Main
Kate Evans
Karina Gallardo
Raymond Jussaume
Vicki McCracken
Nnadozie Oraguzie
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Univ. of Minnesota
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USDA-ARS
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Plant Research Intl, Netherlands
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Marco Bink

Cornell
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Kenong Xu

Clemson
Ksenija Gasic
Gregory Reighard

Texas A&M
Dave Byrne

Univ. of CA-Davis
Tom Gradziel
Carlos Crisosto

Univ. of New Hamp.
Tom Davis

Crop Production & Orchard Management

Professor Koumarov (Bulgaria) – challenges of dwarfing rootstocks

- Tendency to overloading – poor growth – small fruit – stunt trees – dead trees

Pruning

- Promote vigorous growth and restrain cropping
- Severe ("aggressive") pruning

Water regime

- Small and slow water applications
- Small and shallow root system
- Extending irrigation intervals is detrimental

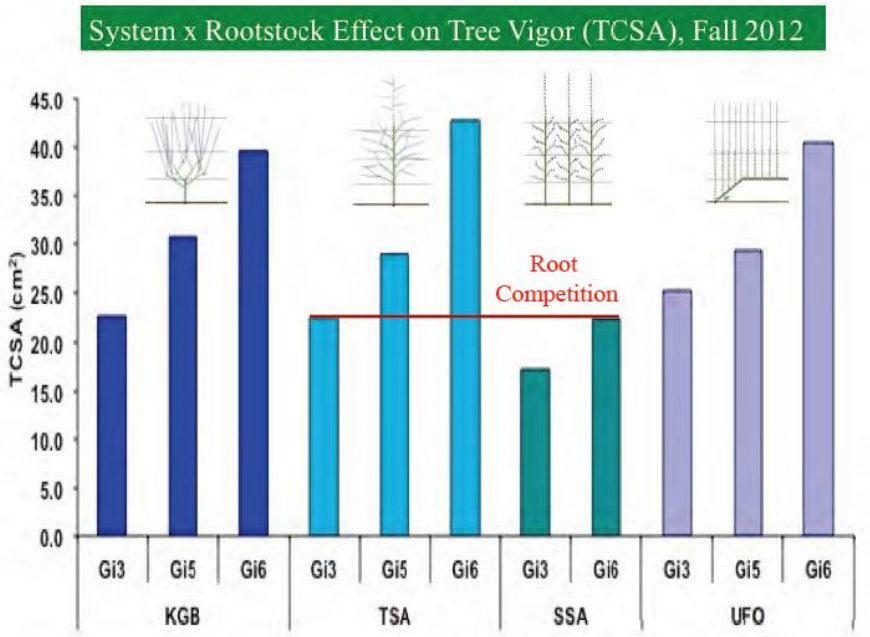
Mineral nutrition

- Small and shallow root system
- Concentration of absorbing roots in the limited volume of soil wetting

ROOT STOCKS & VARIETIES

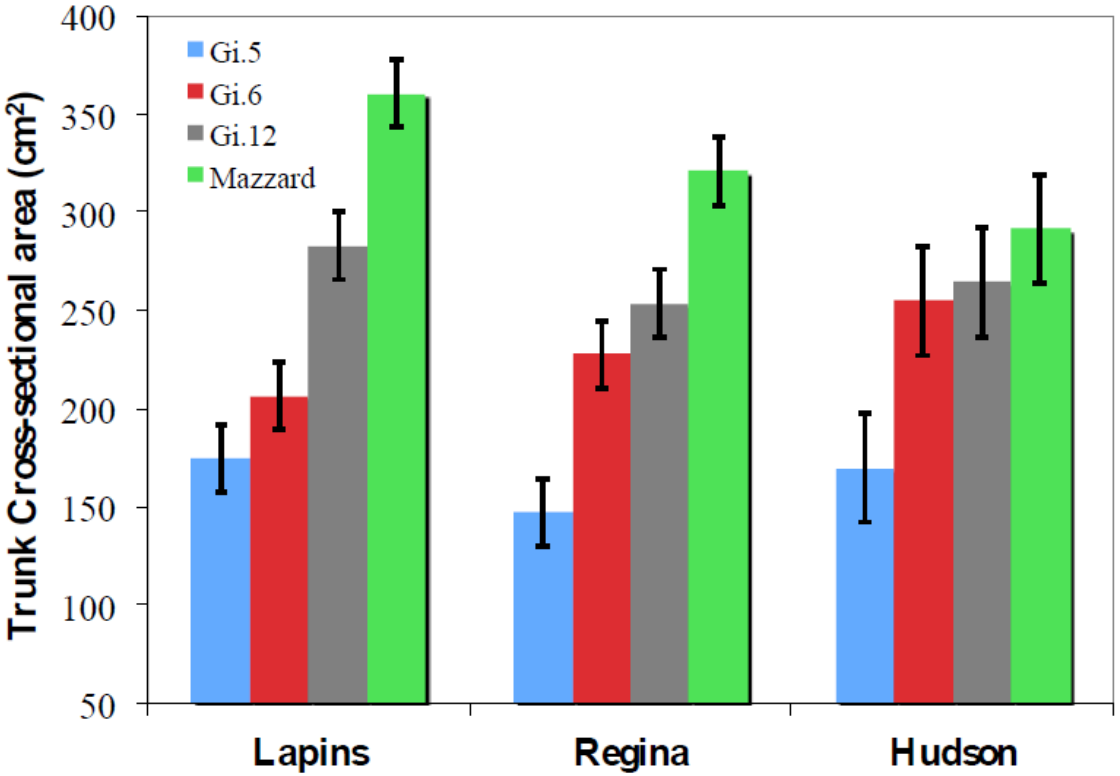
Professor Greg Lang (MSU)
Evaluation of

- 4 orchard systems (KGB, TSA, SSA, UFO)
- 3 Gisela rootstocks (G3, G5, G6)
- Multiple north American sites



ROOT STOCKS & VARIETIES

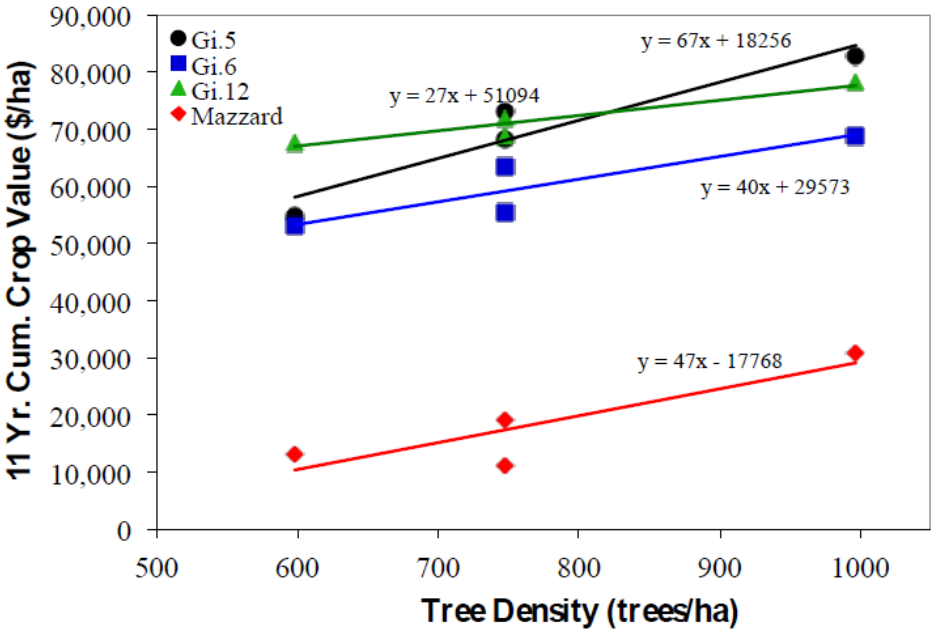
Professor Terence Robinson (Cornell)
Interaction of Training System and Rootstock on Yield, Fruit Size, and Crop Value of Three Sweet Cherry Cultivars



ROOT STOCKS & VARIETIES

Large fruit size on dwarfing stocks

- Manage crop load
- Aggressive pruning
- Remove small diameter twigs (<25cm long)
- Remove whole branches
- Additional Nitrogen fertilizer to keep vigour up



High Density Systems
$27-67/additional tree

TREE FRUIT PHYSIOLOGY

Professor Moritz Knoche (Hannover)
The permeability concept

- Water balance equals sum of flows through surface (transpiration, surface uptake and uptake along stem/fruit juncture) plus vascular transport
- Numerically largest flow associated with transpiration
- Mechanistic model for surface uptake and transpiration, descriptive model for vascular transport and uptake along stem/fruit juncture
- Data base for cracking thresholds in literature is narrow, data available differ by order of magnitude

Combination of 2 different approaches
Potential for collaboration

TREE FRUIT PHYSIOLOGY

Doctor Karen Sagredo (Chile)
Fruit set in Kordia and Regina

- Both experience excess fruit abortion
- Overlapping bloom periods
- Sunburst, Summit and Schneider - Kordia
- Schneider - Regina
- Kordia 30%
- Regina 40%

PESTS & DISEASES

Dr Angela Berrie (East Malling)
Integrated control of fungal rots

- *Monilinia laxa* was the predominant rot present in orchards
- Botrytis rot was significant rot in store in some years but rarely seen in orchard
- Botrytis important if there is frost damage to flowers
- *M. laxa* main source of inoculum is overwintering mummified fruit

Fungal rot	Cherry cultivar / Year sampled			
	Stella		Colney	
	2002	2003	2002	2003
Monilinia laxa	36.4	50.1	36.5	40.1
Monilinia fructigena	4.2	22.5	2.3	6.7
Botrytis cinerea	41.7	4.1	28.9	12.3
Mucor/Rhizopus spp.	8.1	1.9	4.4	1.7
Penicillium spp.	0.8	5.7	5.0	16.4
Cladosporium spp.	0	0.2	0	2.0
Colletotrichum spp.	1.4	4.2	0	0
Other rot	0.6	0	0.4	0
Total loss	85.5	80.5	71.1	65.6
Number of orchards sampled	9	8	8	10

PESTS & DISEASES

Fungicide programme	*M. laxa*	*M. fructigena*	*Botrytis*	*Mucor*	*Penicillium*	Cladosporium	Total rots
Nil	88.5	1.5	13.1	0.3	0.2	0	98.3
Signum	50.9	0.8	33.3	0.6	0.2	0.03	82.1
Indar / Teldor	76.0	2.5	20.5	0.3	1.5	0.4	94.7
Indar / Teldor + Teldor pre-harvest	82.5	0.2	15.5	0.08	2.5	0.03	95.4

- New products needed for suppressing sporulation of mummified fruit
- May be difficult to achieve same effect with orchard spray
- Fungicides currently available as orchard sprays limited efficacy especially in reducing fruit rot in storage

POSTHARVEST

Professor Daniel Valero (Spain)
Maintenance of quality attributes by innovative postharvest treatments

- Aloe
  - Reduced loss of firmness, stem pull, stem colour and weight, reduced loss of phenolics and anthocyanins

- MAP with the addition of essential oils was effective on maintaining cherry quality and reducing postharvest losses
- Cherries dipped in solutions containing salicylic acid delayed the postharvest ripening process and enhanced bioactive compounds with antioxidant activity
- Edible coatings based on Aloe vera and Alginate (alone or with essential oils) are promising postharvest tools to increase shelf life of sweet cherries.

- Potential of essential oils to reduce moulds and yeasts post harvest

Sweet Cherry Growing in Turkey A Brief Overview

Demirsoy, H., Demirsoy, L., Macit, İ., M.E.Akcay, M. Bas, Demirtas, İ., Sarısu, C., Taner, Y., Kuden, A

The 2014 International Horticultural Congress,

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Thank You!