



# 11<sup>th</sup> Annual Meeting of the Board of Directors of PROCINORTE

**Task Force on Tropical and Subtropical Fruits**

**2009 Report and Action Plan 2010+**

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Ottawa, Canada, November 19-20, 2009



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# Members Task Force on Tropical and Subtropical Fruits

- Dr. Clément Vigneault
  - Agriculture and Agri-Food Canada, Co-Chair
- Dr. Samuel Salazar
  - INIFAP-Mexico, Co-Chair
- Dr. Ricardo Goenaga
  - USDA-ARS, Chair
- Collaborators:
  - Dr. Jorge A. Osuna (INIFAP)
  - Dr. José Luis González (INIFAP)
  - Dr. Jacques-André Landry (Université du Québec)
  - Dr. Gilles Doyon (AAFC)

# Background

- **2001.** Canada. TF conception and proposal design.
- **2002.** Washington, D.C. TF was planned.
- **2003.** Nova Scotia, Canada. TF was established with delegates from Canada and Mexico. TF objectives were defined.
- **2004.** Puerto Vallarta, Mexico. USA representative joins the taskforce. Objectives, crops and research projects were prioritized.
- **2005-2006.** USA (Puerto Rico) and Canada (Ottawa). Development of relevant research for the improvement of fruit quality and traceability solutions for producers, packers, transporters, exporters and research agencies were designed and proposed.
- **2007-2010+.** Research on: maturity indices, evaluation of non-destructive techniques to determine ripeness, traceability of fruit to monitor quality during transport, storage conditions, edible coatings, etc.

# Objective of Task Force

Establish research collaboration among taskforce members in order to solve tropical and subtropical fruit production, quality and safety problems in areas of mutual interest.

**Production** affected by: orchard management; varieties.

**Quality** affected by: orchard management; post harvest diseases; fruit handling, storage and transportation.

**Safety** affected by: orchard and postharvest management (GAP, GMP, GHP & HACCP).



**PROCINORTE**  
Task Force on Tropical and  
Subtropical Fruits



# 2008 - 2009 Accomplishments



# Accomplishments

- Task Force Web page (<http://www.ars-grin.gov/may/procinorte/index.html>) is continually updated and now contains references/links to the most recent scientific papers and presentations from members of the Task Force.
- Web page is available in English, Spanish and French.





## PROCINORTE Task Force on Tropical and Subtropical Fruits



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## PROCINORTE

### Task Force on Tropical and Subtropical Fruits

Welcome to the official site of the Task Force on Tropical and Subtropical Fruits, part of PROCINORTE (<http://www.iica.org.mx/procinorte.htm>).

PROCINORTE's Tropical and Subtropical Task Force was created in 2000-2001 to improve links between Mexico, Canada and the United States for research issues related to quality, safety and traceability of tropical and subtropical fruits.



As part of PROCINORTE, our organization has the objective of facilitating the exchange of experiences, information and training through the building of linkages among public and private country institutions in the North American region, and between the mayor research and technology transfer actors in the region, hemisphere and the world.



Feel free to browse the various sections of this site in which you will more information on Tropical and Suptropical Task Force. Browse the **Research Projects** section to find more information about our current research activities. There's also a **Photo Gallery** and a **Members** section where you can find contact information of each countries representatives.





## Publications

### 2009

- Ripeness and rot evaluation of 'Tommy Atkins' mango fruit through volatiles detection. *Journal of Food Engineering* (2009) 319–324.



### 2008

- PROCINORTE's Tropical and Subtropical Fruits Task Force: a tri-national effort to improve fruit quality and trade. 2008. *Proceedings of the Caribbean Food Crops Society*. Vol. 44(2):438.
- Relationship between chlorophyll fluorescence and dry matter content of 'Hass' avocado fruit. 2008. *Proceedings of the Caribbean Food Crops Society*. Vol. 44 (2):652.
- Effect of harvest time and ripening degree on quality and shelf life of 'Hass' Avocado. 2008. *Proceedings of the Caribbean Food Crops Society*. Vol. 44(2):653.
- Product Quality and Information Traceability. In: *The Wiley Encyclopedia of Packaging Technology* 3rd Ed. by K. L. Yam. Wiley & Sons, Inc. Pub. Hoboken, NJ. USA.: 1030-1038.



### 2007

- Yield and fruit quality of carambola cultivars grown at three locations in Puerto Rico. 2007. *HortTechnology* 17(4): 604-607.

# 44<sup>th</sup> Caribbean Food Crops Society Meeting Miami, Fla., USA, 13-17 Jul. 2008

- Very well attended. Representatives from USA, Caribbean Basin, Central and South America.
- Taskforce members made several presentations.
- Meeting proved to be an excellent venue to increase visibility of Task Force.
- Participants showed lots of interest in objectives and work of Task Force.



# Task Force activities at CFCS meeting, Miami, Fla., USA

Eight presentations offered by Task Force members as outcomes of research:

1. PROCINORTE'S Tropical and Subtropical Fruits Task Force: a Tri-National Effort to Improve Fruit Quality and Trade
2. Evaluating Avocado Maturity Using Hyperspectral Imaging
3. Yield and Fruit Quality of Rambutan Cultivars Grown at Two Locations in Puerto Rico
4. Crecimientos Vegetativo y Reproductivo del Aguacate 'Hass' en Varios Climas de Michoacán, México
5. Corrección de la Deficiencia Crónica de Zinc en Aguacate 'Hass'
6. Relationship between Chlorophyll Fluorescence and Dry Matter Content of 'Hass' Avocado Fruit
7. Effect of Harvest Time and Ripening Degree on Quality and Shelf Life of 'Hass' Avocado
8. Influencia del Clima, Riego y Época de Floración Sobre la Composición Nutricional del Fruto de Aguacate 'Hass' en Michoacán

## Site visits during the CFCS meeting in Miami, Fla.

- Facilities at the Tropical Research and Education Center (TREC) of the University of Florida, Homestead, Florida.
- USDA-ARS Subtropical Horticulture Research Station, Miami, Florida.
- Brooks Tropicals' avocado orchards and packinghouse facilities, Homestead, Florida.



# Accomplishments ...

- Third National Meeting on Agricultural and Forestry Innovations (Mérida, Yucatán, Méx. Nov. 3-8,2008)
  - Preliminary results on the use of fluorescence to determine harvest maturity of “Ataulfo’ mango.
- First National Congress of Avocado Production Systems (Uruapan, Michoacán, Méx. Dec. 3-5,2008)
  - Evaluation of chlorophyll fluorescence as an alternative to determine maturity in ‘Hass’ avocado.
- Third Latin American Congress of Avocado (Medellin, Colombia. Nov. 11-13, 2009 )
  - Five presentations made on postharvest physiology, fertilization, and flowering of avocado.



# Accomplishments ....

- Publication of brochure “Use of zinc and boron to increase fruit size and quality of ‘Hass’ avocado”
  - In final edition.
- Manuscript: Effect of harvest time and ripening degree on quality and shelf life of Hass avocado fruit
  - In final edition.
- Manual: Validation of quick screening techniques to monitor water quality in hot water treatment tanks in packinghouses for mango export.
  - In final review.

# Accomplishments ....

- Electronic publication: A Guide to Recognize and Eat Some Tropical and Subtropical Fruits.
  - Recipes section in TF Website
- Technology Transfer: Incorporation of avocado recipes in websites from avocado growers associations.
  - Asociacion Agricola Local de Productores de Aguacate de Uruapan, Michoacan  
[www.aproam.cpm](http://www.aproam.cpm)
  - Asociacion de Productores y Empacadores exportadores de Aguacate de Michoacan  
[www.apeama.com](http://www.apeama.com)

# Ongoing Projects

1. Effect of pre- and postharvest management practices on mango and avocado shelf-life.
2. Identification of mango germplasm for anthracnose resistance through field screening and marker assisted selection.
3. Development of non-destructive optical vision technology for quality assessment in avocado, mango and mamey sapote.
4. Validate rapid methods to detect microbiological contamination (water, fruit and surfaces).

# 2009 Action Plan

• Activity	Budget (USD)
• Evaluation and calibration of the chlorophyll fluorescence technique to determine “on tree” legal maturity of ‘Hass’ avocado, as well as Evaluating Hass avocado maturity using Hyperspectral Imaging	5,800 Postponed 2010
• Calibration of chlorophyll fluorescence to determine “on tree” ripeness of ‘Ataulfo’ mango.	1,200 Postponed 2010
• Preliminary evaluation of chlorophyll fluorescence to determine “on tree” ripeness of mamey sapote.	4,000 Postponed 2011
• Validation of quick techniques to monitor water quality in hot water treatment tanks in exporting mango packinghouses. A Manual will be published.	600
• Publication of the brochure “Use of zinc and boron to increase fruit size and quality of ‘Hass’ avocado”. 1000 brochures.	2,200
• Annual meeting of the Task Force.	12,000(?)
• Annual meeting of the Board of Directors of PROCINORTE. Place TBA.	2,000
<b>Total USD \$</b>	<b>27,800</b>

**APPROVED: \$20,000**

**SPENT: \$16,800**

# 2010 Action Plan

• Activity	Budget (USD)
• Evaluation and calibration of the chlorophyll fluorescence technique to determine “on tree” legal maturity of ‘Hass’ avocado.	4,000
• Evaluating Hass avocado maturity using hyperspectral imaging	6,000
• Calibration of chlorophyll fluorescence to determine “on tree” ripeness of ‘Ataulfo’ mango.	2,000
• Annual meeting of the Task Force. ASHS Meeting.	10,000
• Annual meeting of the Board of Directors of PROCINORTE. Place TBA.	2,000
<b>Total USD \$</b>	<b>24,000</b>



# Task Force strengths

- The Task Force is multidisciplinary, research-oriented, and very active.
- Crops and research priorities are well defined.
- Members have presented research objectives to potential customers and stakeholders in the three countries.
- There is a significant number of scientists willing to participate in collaborative research.

# Task Force constrains

- Administrative regulations as well as budget constrains at each delegate's institution make difficult to spend money with researchers from abroad.
- International travel expenses restrict participation to accomplish Task Force objectives.
- Future research requires acquisition of portable equipment to standardize methodologies in the three countries.

# Funding

- As countries belonging to the Organization for Economic Cooperation and Development (OECD), we have little access to research and development assistance. Institutional support from international divisions within INIFAP, AAFC, and ARS to support Taskforce research would be beneficial to accomplish goals.
- Alternative strategies for funding should be considered by the Board of Directors.

# Possible users of products resulting from our Action Plan

- The Canadian, Mexican and USA customers and stakeholders such as producers, packers, technology providers, extension agents, researchers.
- Regulatory agencies, certification bodies.
- Governmental institutes/agencies, research organizations, universities: delivery of technology transfer methods to improve production, safety and quality issues of mutual interest to the three countries.
- IICA and its members.



# Acknowledgements

- INIFAP, AAFC, and ARS.
- IICA Canada, USA and Mexico.
- PROCINORTE's Board of Directors.
- Customers and stakeholders for their openness and hospitality.





**THANKS,  
QUESTIONS?**

