Global Industry Review
Forest Tree Nut Crops

Mr. Pino Calcagni
Vice Chairman, Chairman of the Statistics Committee, and Scientific and Government Affairs Committee, INC International Nut and Dried Fruit Council
INC International Nut & Dried Fruit Council

- **Vision**: To be the international source for information on Nuts and Dried Fruits for health, nutrition, statistics, food safety, government standards and regulations regarding trade barriers and agricultural quality standards.

- **Mission**: To stimulate and facilitate sustainable growth in the global Nut and Dried Fruit Industry.

- **Information resources**
  - Being the international source of information on health, nutrition, statistics, food safety, government standards and regulations regarding trade barriers and agricultural quality standards.

- **Statistics**
  - Increasing the understanding about production, trade and consumption trends worldwide.

- **Industry’s voice**
  - Cooperating with national and international institutions, such as Codex and UN, to further global N&DF trade.

- **Health & nutrition**
  - Promoting scientific research on the health benefits of N&DF consumption.

Helping the Nut & Dried Fruit industry to grow.
About us

17 Products
- Almonds
- Apricot Kernels
- Brazil Nuts
- Cashews
- Hazelnuts
- Macadamias
- Pecans
- Pine Nuts
- Pistachios
- Walnuts
- Peanuts
- Dates
- Dried Apricots
- Dried Cranberries
- Dried Figs
- Prunes
- Raisins, Sultanas & Currants

- 800+ companies from 75+ countries
- A Board of Trustees from 12 countries
- Ambassadors in 30+ countries
- An international team: 15 sub-committees

Membership
- Africa, Asia, Oceania: 35%
- America: 34%
- Europe: 31%

Publications/Resources
- Newsletters
- Nutfruit Magazine
- Online Database
- Statistical Yearbook
- Trade Flows World Maps
- Technical Information Kits
- Allergens Toolkit
World Tree Nut Production

World Tree Nut Production (Metric Tons)
Kernel basis, except pistachios in-shell. Source: INC

World Tree Nut Production (Metric Tons)
Kernel basis. Source: INC

Almonds  Walnuts  Cashews  Pistachios  Hazelnuts

Pecans  Macadamias  Brazil Nuts  Pine Nuts
World Tree Nut Supply Value

Tree Nut Supply Value (Billion $)
Kernel basis, except pistachios in-shell. Source: INC

- **Almonds**
  - 2007/08: 1.5
  - 2008/09: 1.9
  - 2009/10: 2.3
  - 2010/11: 2.6
  - 2011/12: 2.8
  - 2012/13: 3.0
  - 2013/14: 2.9
  - 2014/15: 2.7
  - 2015/16: 2.5
  - 2016/17: 2.4
  - 2017/18: 2.3
  - 2018/19: 2.2

- **Pistachios**
  - 2007/08: 0.9
  - 2008/09: 1.1
  - 2009/10: 1.3
  - 2010/11: 1.5
  - 2011/12: 1.7
  - 2012/13: 1.9
  - 2013/14: 2.1
  - 2014/15: 2.3
  - 2015/16: 2.5
  - 2016/17: 2.7
  - 2017/18: 2.9
  - 2018/19: 3.1

- **Cashews**
  - 2007/08: 3.0
  - 2008/09: 3.9
  - 2009/10: 4.9
  - 2010/11: 5.9
  - 2011/12: 6.4
  - 2012/13: 6.6
  - 2013/14: 6.8
  - 2014/15: 7.0
  - 2015/16: 7.3
  - 2016/17: 7.5
  - 2017/18: 7.8
  - 2018/19: 8.2

- **Walnuts**
  - 2007/08: 4.3
  - 2008/09: 5.4
  - 2009/10: 6.7
  - 2010/11: 7.7
  - 2011/12: 8.2
  - 2012/13: 9.0
  - 2013/14: 9.7
  - 2014/15: 10.0
  - 2015/16: 10.3
  - 2016/17: 10.5
  - 2017/18: 10.7
  - 2018/19: 10.9

- **Hazelnuts**
  - 2007/08: 0.6
  - 2008/09: 0.9
  - 2009/10: 1.4
  - 2010/11: 1.5
  - 2011/12: 1.6
  - 2012/13: 1.7
  - 2013/14: 1.8
  - 2014/15: 1.9
  - 2015/16: 2.0
  - 2016/17: 2.1
  - 2017/18: 2.2
  - 2018/19: 2.3

- **Pecans**
  - 2007/08: 0.2
  - 2008/09: 0.3
  - 2009/10: 0.5
  - 2010/11: 0.7
  - 2011/12: 0.9
  - 2012/13: 1.0
  - 2013/14: 1.1
  - 2014/15: 1.2
  - 2015/16: 1.3
  - 2016/17: 1.4
  - 2017/18: 1.5
  - 2018/19: 1.6

- **Macadamias**
  - 2007/08: 0.3
  - 2008/09: 0.4
  - 2009/10: 0.5
  - 2010/11: 0.6
  - 2011/12: 0.7
  - 2012/13: 0.8
  - 2013/14: 0.9
  - 2014/15: 1.0
  - 2015/16: 1.1
  - 2016/17: 1.2
  - 2017/18: 1.3
  - 2018/19: 1.4

- **Pine Nuts**
  - 2007/08: 0.2
  - 2008/09: 0.3
  - 2009/10: 0.5
  - 2010/11: 0.7
  - 2011/12: 0.9
  - 2012/13: 1.0
  - 2013/14: 1.1
  - 2014/15: 1.2
  - 2015/16: 1.3
  - 2016/17: 1.4
  - 2017/18: 1.5
  - 2018/19: 1.6

- **Brazil Nuts**
  - 2007/08: 0.3
  - 2008/09: 0.4
  - 2009/10: 0.5
  - 2010/11: 0.6
  - 2011/12: 0.7
  - 2012/13: 0.8
  - 2013/14: 0.9
  - 2014/15: 1.0
  - 2015/16: 1.1
  - 2016/17: 1.2
  - 2017/18: 1.3
  - 2018/19: 1.4

**World Tree Nut Supply Value**

- **Brazil Nuts**
  - Value: $0.26 Billion
  - Tons: 38,500 Metric Tons

- **Cashews**
  - Value: $7.5 Billion
  - Tons: 840,000 Metric Tons

- **Pine Nuts**
  - Value: $0.56 Billion
  - Tons: 21,500 Metric Tons

Forest Tree Nuts Supply Value: over $8 Billion
Map shows the major trade flows among leading trading countries.
Map shows the major trade flows among leading trading countries.
At present, collectors only access to 20% of the growing area.

The remaining 80% remains unexploited.

Potential to increase Brazil nut global production 4 times the current crop.

2019/2020 forecast: 86,100 metric tons (in-shell basis) / 28,700 MT (kernel basis).

Potential crop: 386,000 MT / 127,500MT.
The Brazil nut tree, *Bertholletia excelsa*, is one of the most important economic plants of the Amazonian forest due to its valuable edible seeds, known as Brazil nuts (Mori, 1992).

Brazil nuts are globally traded and collected by natives from the wild since there are no economically viable plantations.

The nuts are an important source of income for the local communities, which depend directly or indirectly on the Brazil nut trade (Arrus et al., 2005).

Brazil nuts are one of the most important Non-Wood Forest Products (NTFPs) and have an important role in the preservation of the Amazonian rainforest (Arrus et al., 2005).

Brazil nut pods can be used as a source of plant fiber.

The Brazil nut model represents a socioecological system that may not require major changes to sustain productivity, supporting the “conservation-through-use” (Guariguata et al., 2017 and quotes cited therein).
Domestic efforts to curb deforestation:

- Peru and Brazil have both included measures to reduce deforestation in their Nationally Determined Contributions (NCDs) towards keeping global temperature rise below 20°C.

- Opportunities exist to bolster conservation of Brazil nut-rich forests through incentives associated with Reducing Emissions from Deforestation and Forest Degradation (REDD+).

- Peru’s National Forest Conservation Program grants subsidies per hectare to native and indigenous communities holding large tracts of forest in exchange for avoiding deforestation and degradation.

World Brazil Nut Production

WORLD BRAZIL NUT PRODUCTION
Kernel Basis (Metric Tons). Source: INC

2019/20 BRAZIL NUT PRODUCTION (forecast)
Kernel Basis (Metric Tons). Source: INC

- Bolivia, 77%
- Peru, 16%
- Brazil, 7%
World Brazil Nut Exports

WORLD BRAZIL NUT EXPORTS
Shelled (Metric Tons). Source: UN Comtrade and INC

2017 WORLD BRAZIL NUT EXPORTS
Shelled (Metric Tons). Source: UN Comtrade and INC

- Bolivia, 53%
- Peru, 13%
- Germany*, 9%
- Netherlands*, 7%
- USA*, 6%
- Others, 12%

* Transit country
## World Brazil Nut Imports

### WORLD BRAZIL NUT IMPORTS / Shelled (Metric Tons). Source: UN Comtrade and INC

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Source: INC


2 Based on the estimated percentage of population consuming the specific product.
CASHEWS – Growing areas
CASHEWS - Facts

- Cashews trees grow in tropical areas and are native of **North-east Brazil**. During the 16th century, the Portuguese introduced it into **India** and Portuguese colonies in **Africa**. From India, cashew trees spread all over **South-east Asia**.

- The cashew establishment as a cash crop began in the 1950’s and significantly expanded since the 1990’s (Monteiro et al., 2017).

- The cashew shell contains an inedible phenolic oil, known as **cashew nut shell liquid (CNSL)** which has wide industrial uses thanks to its polymerizing and friction-reducing properties.

- The **cashew pear (apple)** is very high in Vitamin C and can be eaten fresh, mixed in fruit salads, or made into juice, which can be distilled to produce alcoholic drink.

- The cashew tree is widely **used in afforestation programs** as it does not require extensive irrigation or water-usage; it is environmentally friendly as the trees can grow in poor soils and dry climatic conditions.
Cashew cultivation as an opportunity of sustainable growth in West Africa

- Cashew cultivation contributes to both Gross Domestic Product (GDP) and exports exchanges in developing countries.

- It is an essential resource for the livelihood of smallholder farmers, providing positive economic and social effects: inclusive growth, poverty alleviation and land securing (maintenance of ownership and fallow).

- **Higher profitability** due to reduced production cost vs. cereals, for instance.

- Plantations implemented in fallow lands within semi-natural or savanna woodlands.

- Challenges: **Limited productivity** per hectare since standard agronomical practices are difficult to adopt and loss of biodiversity.

In West Africa, cashew is a case of a crop under agricultural expansion, which is currently in need of **secure guidelines for sustainable production** (Monteiro et al., 2017).
Global Cashew Council

Vision

Achieving global growth and sustainability of the cashew nut sector.

Mission

Promoting the global cashew nut sector by increasing awareness of the health benefits of cashews, promoting usage and consumption, and promoting food safety and quality standards.

- The INC formed the GCC aiming to bring together and keep producing and processing countries under the same umbrella.

- The efforts of the GCC in promoting Good Agricultural Practices (GAP) in the producing countries have contributed to the increment in the global production.
1. To provide worldwide statistics of cashew production and consumption trends and to promote growth with a good balance between supply and demand.

2. To study and promote usage and consumption of cashews using appropriate platforms throughout the world.

3. To research the nutritional profile of cashews, to determine appropriate health platforms and possible health-claims, and to validate these benefits with scientific research including clinical trials.

4. To launch a program of activities to disseminate and publicize health messages related to cashews around the world.

5. To evaluate and suggest basic industry-standards for compliance with food safety regulations and issues internationally, and to work with regulatory bodies worldwide on food safety, social and ethical issues related to cashews.

6. To work actively on global cashew standards, with adaptations for different origins and destinations if necessary.

7. To evaluate possible synergies in the cashew value-chain and create added value to benefit producers, processors, traders, the food industry and the final consumer.

8. To liaison with international institutions such as the FAO, WTO, WHO, EU, CFC, etc. and other governmental and non-governmental bodies to gather necessary support for the above activities.
World Cashew Production

WORLD CASHEW PRODUCTION
Kernel Basis (Metric Tons). Source: INC

2019/20 CASHEW PRODUCTION (forecast)
Kernel Basis (Metric Tons). Source: INC

- Western Africa, 46%
- India, 21%
- Eastern Africa, 11%
- Vietnam, 9%
- Brazil, 4%
- Cambodia, 3%
- Indonesia, 2%
- Others 8%
World Cashew Exports

WORLD CASHEW EXPORTS
Shelled (Metric Tons). Source: UN Comtrade and INC

2017 WORLD CASHEW EXPORTS
Shelled (Metric Tons). Source: UN Comtrade and INC

- Vietnam*, 53%
- India*, 23%
- Netherlands**, 7%
- Germany**, 3%
- Brazil*, 2%
- Others, 12%

* Processing country
## World Cashew Imports

**WORLD CASHEW IMPORTS / Shelled (Metric Tons). Source: UN Comtrade and INC**

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* Processing country
** Transit country
## World Cashew Estimated Consumption

### WORLD CASHEW ESTIMATED CONSUMPTION (Kernel Basis). Source: INC

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2. Based on the estimated percentage of population consuming the specific product.
PINE NUTS – Growing areas
PINE NUTS - Facts

- Pine nuts are the edible seeds of the pine trees, which are spread across the Northern hemisphere in Asia, Europe, the Near East and North America. Several species of pine trees produce edible nuts.

- They are adapted to a **wide range of weather conditions**: from the cold climate of North East Siberia to the hot dry deserts of Nevada and Mexico. They are long-lived and may reach ages of 100-1,000 years, or even longer.

- Pine nuts are considered as a **gourmet product** and are very appreciated as ingredients for several recipes, e.g. the world-famous “pesto” sauce. Most of the pine nuts are **marketed shelled**, although a small quantity is marketed in-shell.

- Most of the pine nuts available on the market come from **natural forests**, where no cultivation techniques are applied except for silvicultural practices. Commercial plantations are very scarce.

- Although pine nuts are collected without any expense of plantation forestry, the labor cost is particularly important given that the **collection and processing are very labor intensive**.
PINE NUTS – Sustainability (Mutke et al., 2018)

- Pine nuts are among the **Non-wood Forest Products (NWFP’s)** collected from Mediterranean forest.

- NWFP’s are relevant resources for rural economies and play a role in circular bioeconomy as sustainable alternatives to fossil raw materials, e.g. resin from pine cones or cork.

- NWFP’s have been regaining recognition as essential resources for livelihood and sustainability of forest use, and as a contribution to rural household economies and food security, to national economies and environmental objectives.

- Overall challenges: fair profitability for all actors in the value chain and raising consumer awareness.

- Challenges for Mediterranean pine nuts: damages by exotic pests (e.g. conifer seed bug), decreased yields due to increasing droughts, persisting black markets and lack of effective implementation of certified and traced quality standards “form forest to fork” (mandatory as per the Regulation (EC)178/2002).

In this context, aiming at innovation and capacity building in production, processing and trade of Mediterranean NWFPs, the thematic network INCREDEIBLE (Innovation Networks of Cork, Resins and Edibles in the Mediterranean basin) was launched by EFIMED, the Mediterranean Facility of the European Forest Institute, funded by the European Union's Horizon 2020 Research and innovation program.

The following priority themes were marked for future INCREDEIBLE activities:

1. Processing quality (standards and good practices for each product line).
2. Mitigation of damages from pest and diseases, as well as ongoing climate change.
3. Optimized forest and plantation management and tending schemes (good practices).
4. Improved marketing, labelling, and consumers’ awareness rise about health, environment and cultural benefits of wild nut consumption, e.g. by organic food and/or sustainably managed forest product labels.

China Sustainability Programs

- The exploitation of land, forest and water over thousands of years along with the rapid population rise, industrialization and development since the 1950’s had seriously degraded China’s environment culminating in a sustainability emergency.

- China responded to this emergency via an integrated portfolio of 16 sustainability programs, including afforestation and reforestation programs (USD 378.5 billion, 623.9 million hectares and 500+ million people since 1998).

- Environmental objectives: to reduce erosion, sedimentation and flooding; conserve forest; mitigate desertification and dust storms; and increase agricultural.

- Socio-economic objectives: poverty reduction, rural economic development, and national food security.

- Despite some adverse outcomes, China’s integrated portfolio of sustainability programs has achieved considerable overall success.

Current Pine Nut world demand is higher than supply, which represents an opportunity to growth.

INC statistics account only for marketable product.
INC statistics account only for marketable product.
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*Processing for pesto sauce

INC statistics account only for marketable product.
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2 Based on the estimated percentage of population consuming the specific product.
**INC Megatrends Project**

**Production**
- ✔ Bearing planted area by producing region
- ✔ Non-bearing planted area by producing region
- ✔ New plantings up to 2030
- ✔ Projected production up to 2030

**Sustainability**
- ✔ Water management: drip, sprinkler, flood irrigation, rainfed
- ✔ By-products: Livestock food, composting, biomass, mulching, livestock bedding, substances or material generation
- ✔ Renewable energies: bioenergy, hydropower, geothermal, solar, wind energies

**Objective:** To estimate future production levels of nuts and dried fruits and to analyze trends on sustainability.
UN Sustainable Development Goals (SDGs)

Food and agriculture can help achieve multiple SDGs¹

1. NO POVERTY
2. ZERO HUNGER
3. GOOD HEALTH AND WELL-BEING
4. QUALITY EDUCATION
5. GENDER EQUALITY
6. CLEAN WATER AND SANITATION
7. AFFORDABLE AND CLEAN ENERGY
8. DECENT WORK AND ECONOMIC GROWTH
9. INDUSTRY, INNOVATION AND INFRASTRUCTURE
10. REDUCED INEQUALITIES
11. SUSTAINABLE CITIES AND COMMUNITIES
12. RESPONSIBLE CONSUMPTION AND PRODUCTION
13. CLIMATE ACTION
14. LIFE BELOW WATER
15. LIFE ON LAND
16. PEACE, JUSTICE AND STRONG INSTITUTIONS
17. PARTNERSHIPS FOR THE GOALS

¹FAO. 2018. Transforming food and agriculture to achieve the SDGs
Thank you for your attention