

Sustainable Production and Trade of Nuts and Dried Fruit: General Overview

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



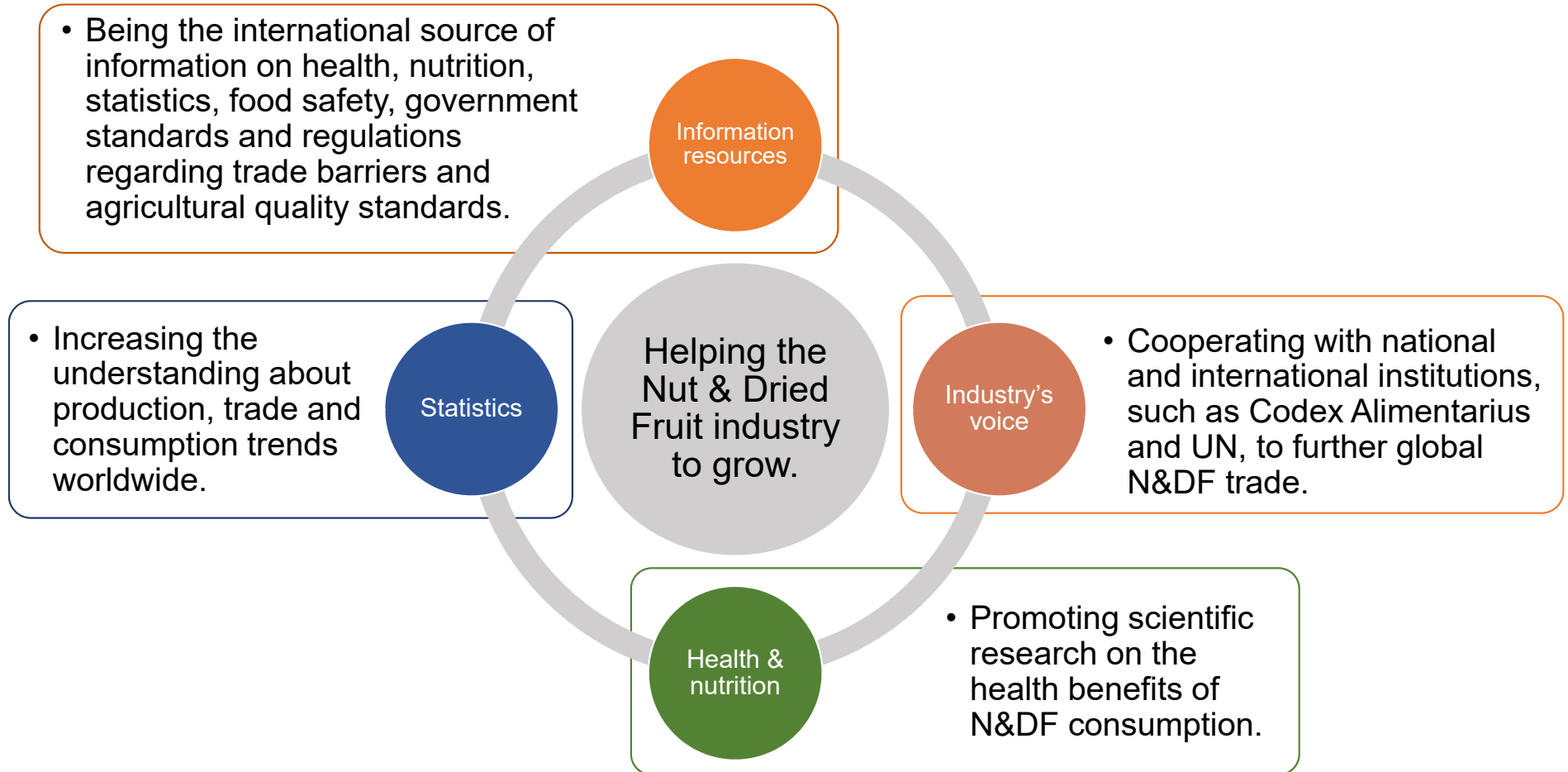
■ Vision

- 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.

INC aims for



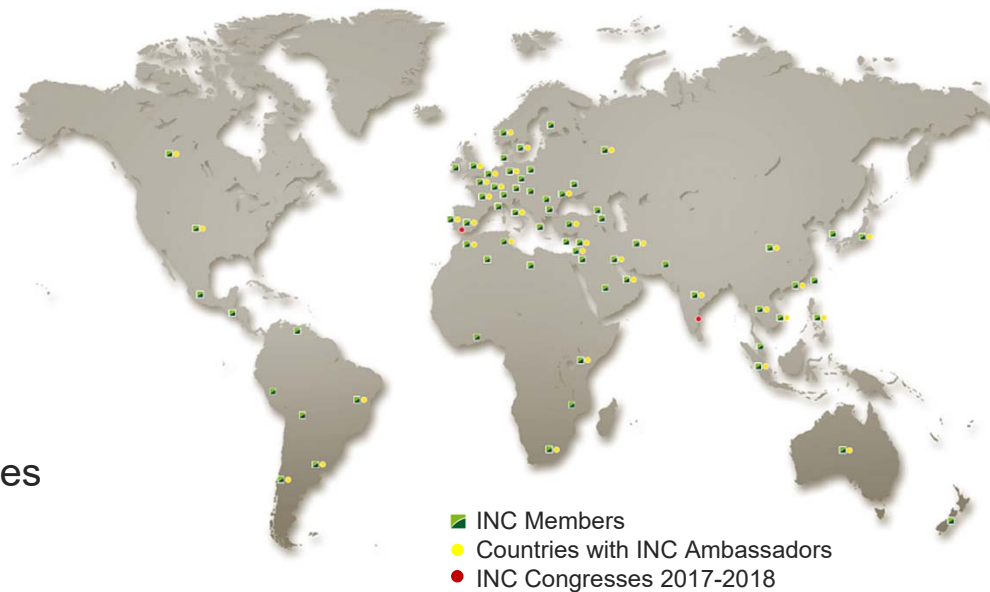
About us



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

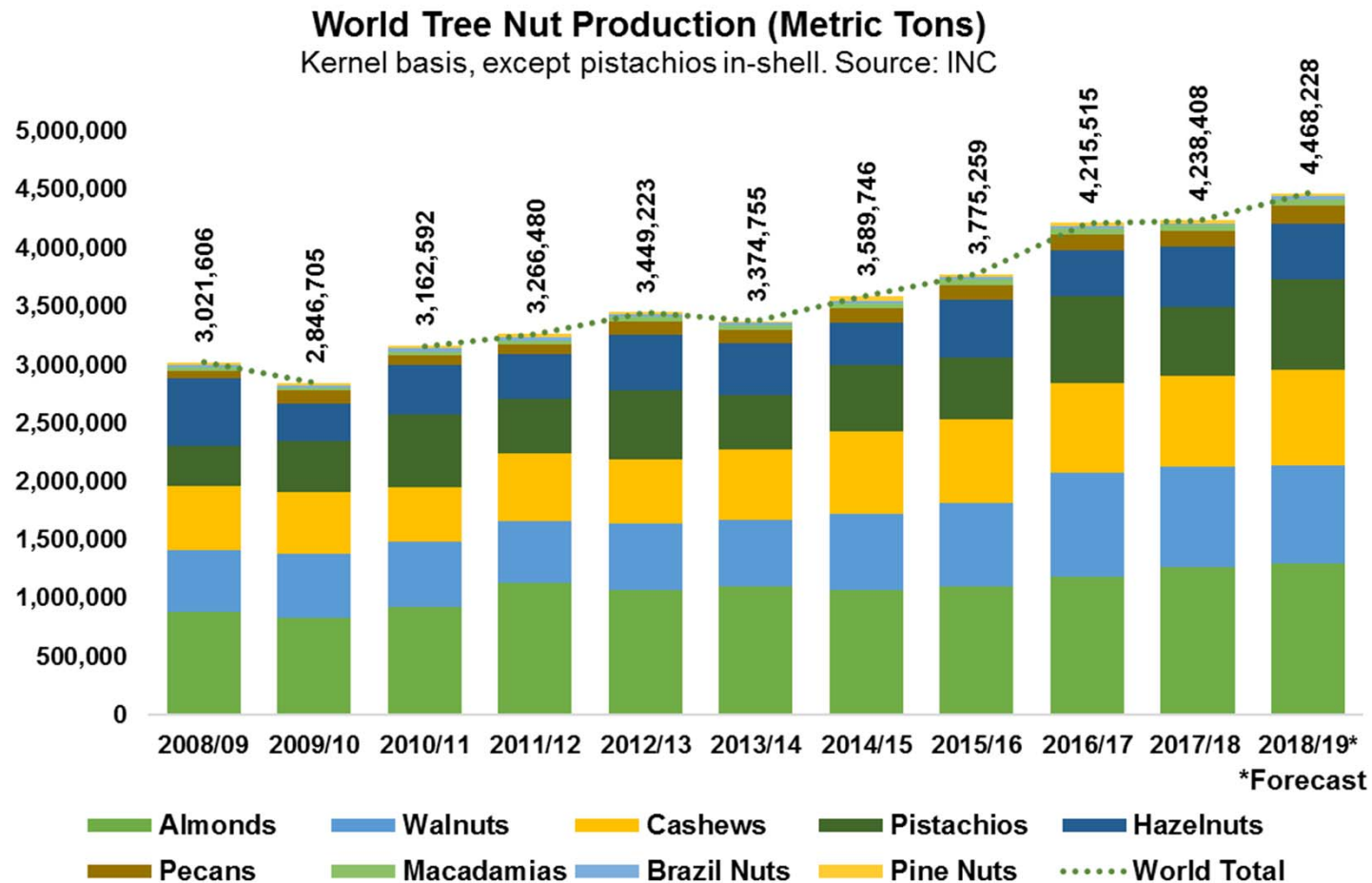
- Membership: **+800 companies from +75 countries.**
- A Board of Trustees from 12 countries.
- Ambassadors in +30 countries.
- An international team: 15 sub-committees.



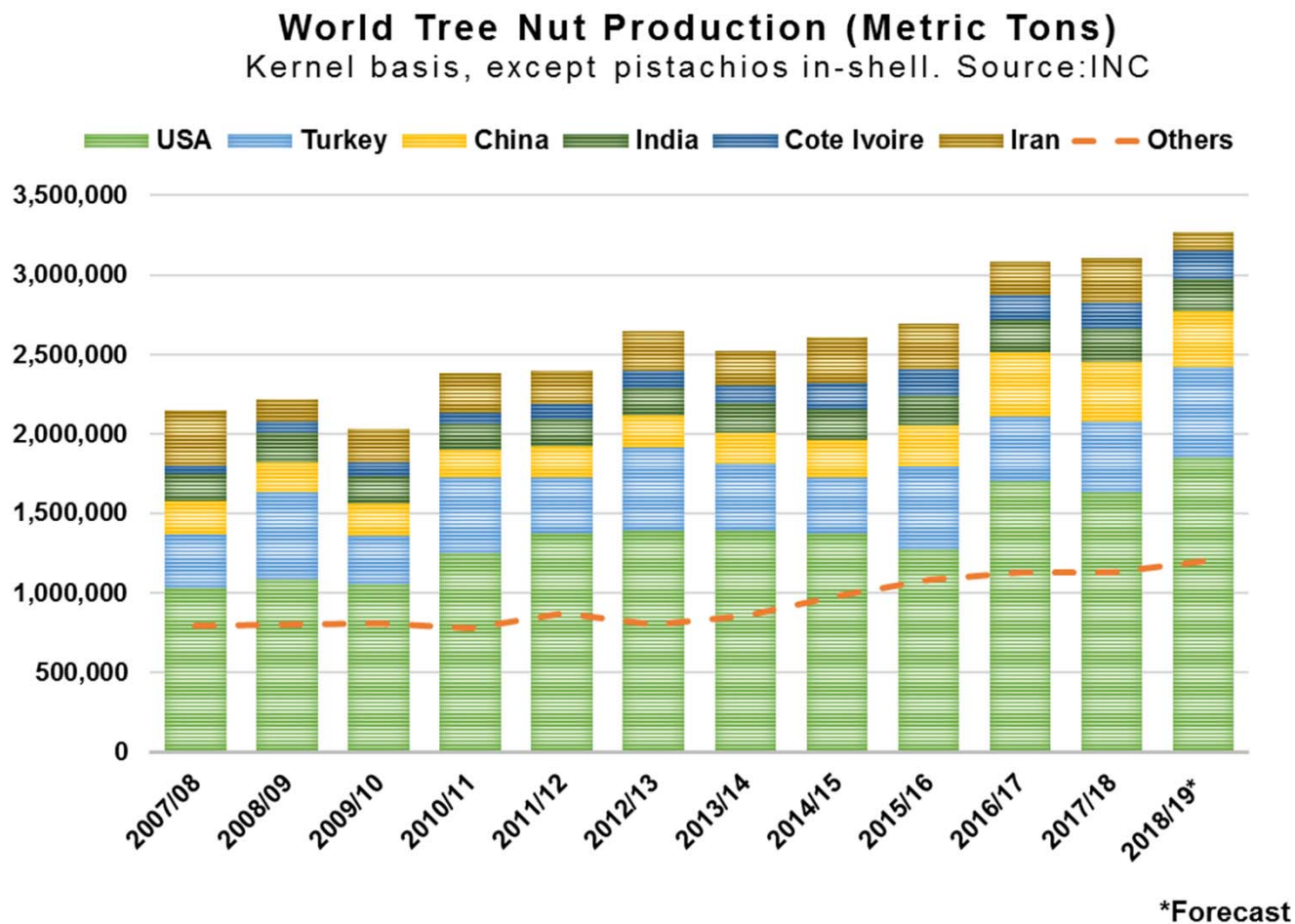
Publications

- Monthly Newsletter
- Weekly *Cracking the News*
- *Nutfruit* Magazine
- Online Database
- Statistical Yearbook
- Trade Flows World Map
- Technical Information Kits

Global Statistical Review- World Tree Nut Production

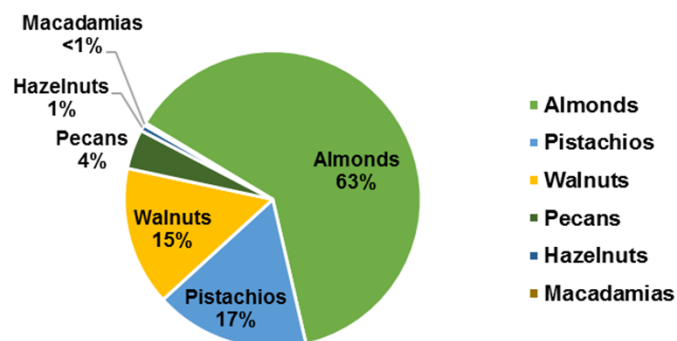


Global Statistical Review- World Tree Nut Production

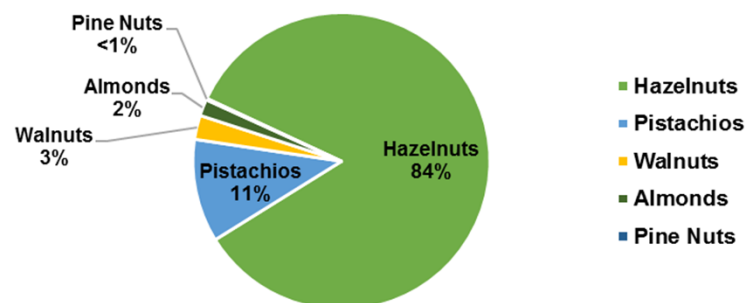


Global Statistical Review- World Tree Nut Production

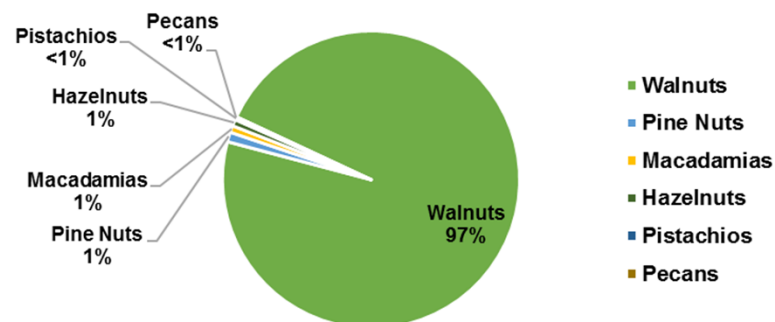
USA 2017/18 Tree Nut Production (Metric Tons)
Kernel basis, except pistachios in-shell. Source: INC



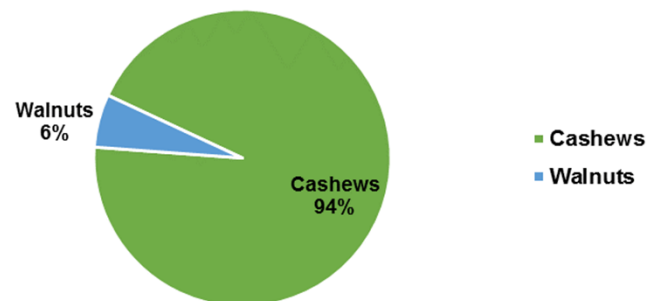
Turkey 2017/18 Tree Nut Production (Metric Tons)
Kernel basis, except pistachios in-shell. Source: INC



China 2017/18 Tree Nut Production (Metric Tons)
Kernel basis, except pistachios in-shell. Source: INC



India 2017/18 Tree Nut Production (Metric Tons)
Kernel basis, except pistachios in-shell. Source: INC



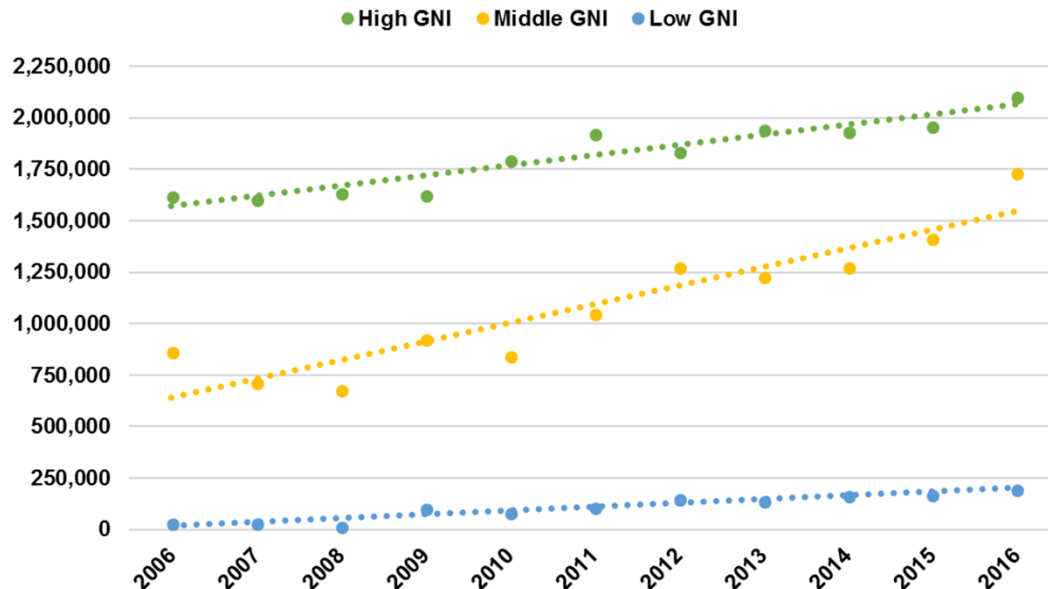
Global Statistical Review- World Tree Nut Consumption



World Tree Nut Estimated Consumption by GNI*

(Metric Tons)

Kernel basis, except pistachios in-shell. Source: INC



*Gross National Income *per capita*

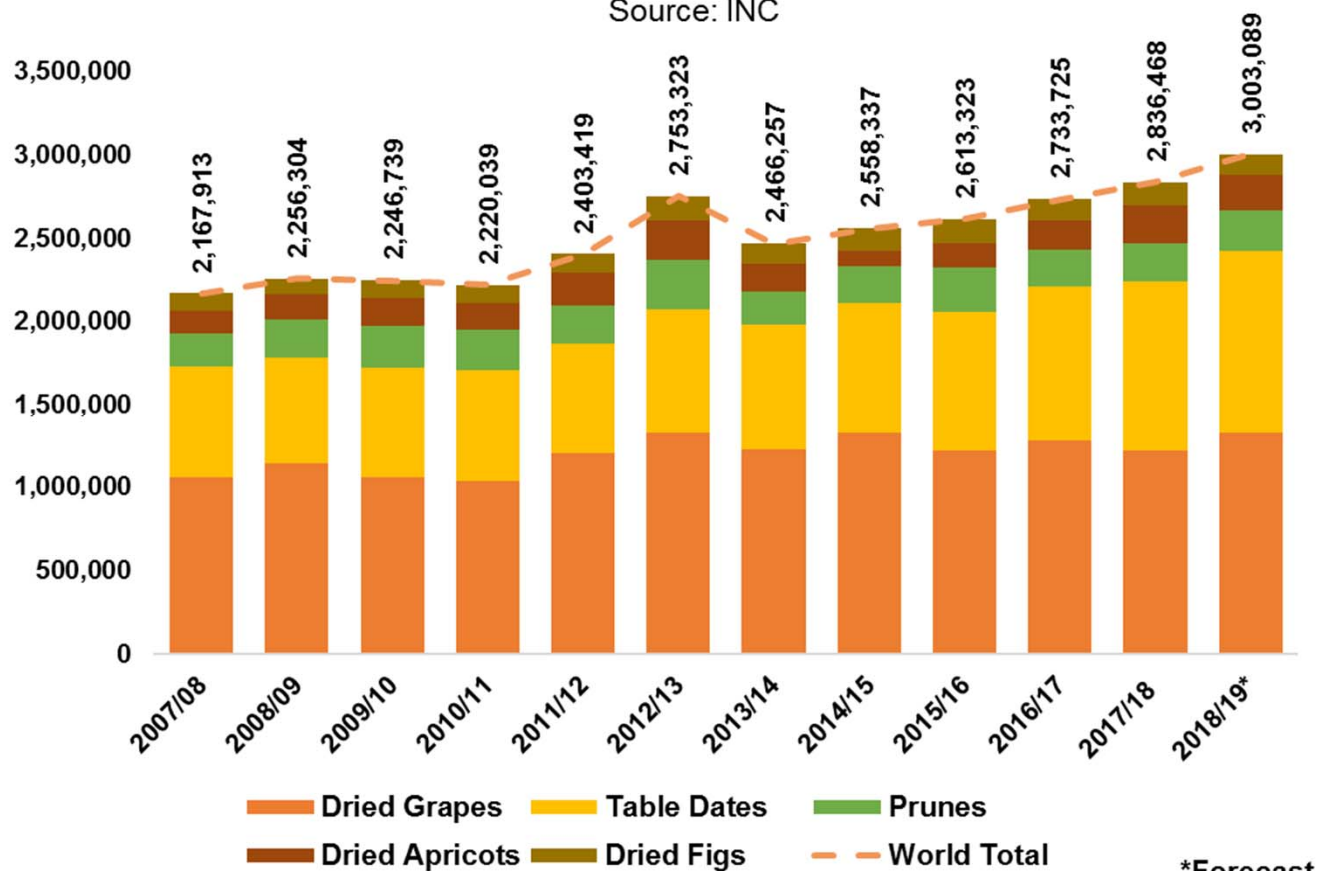
Consuming countries classified according to their gross national income (GNI) *per capita*, using the World Bank Atlas method:

- **High-Income Economies:** GNI *per capita* of **\$12,746 or more** (Australia, Chile, Europe, USA...)
- **Middle-Income Economies:** (includes both Lower-Middle-Income Economies and Upper-Middle-Income Economies): **GNI *per capita* from \$1,046 to \$12,746** (China, Cote d'Ivoire, India, South Africa...)
- **Low-Income Economies:** GNI *per capita* of **\$1,045 or less** (Afghanistan, Burkina Faso, Kenya, Zimbabwe...)

Global Statistical Review- World Dried Fruit Production

World Dried Fruit Production (Metric Tons)

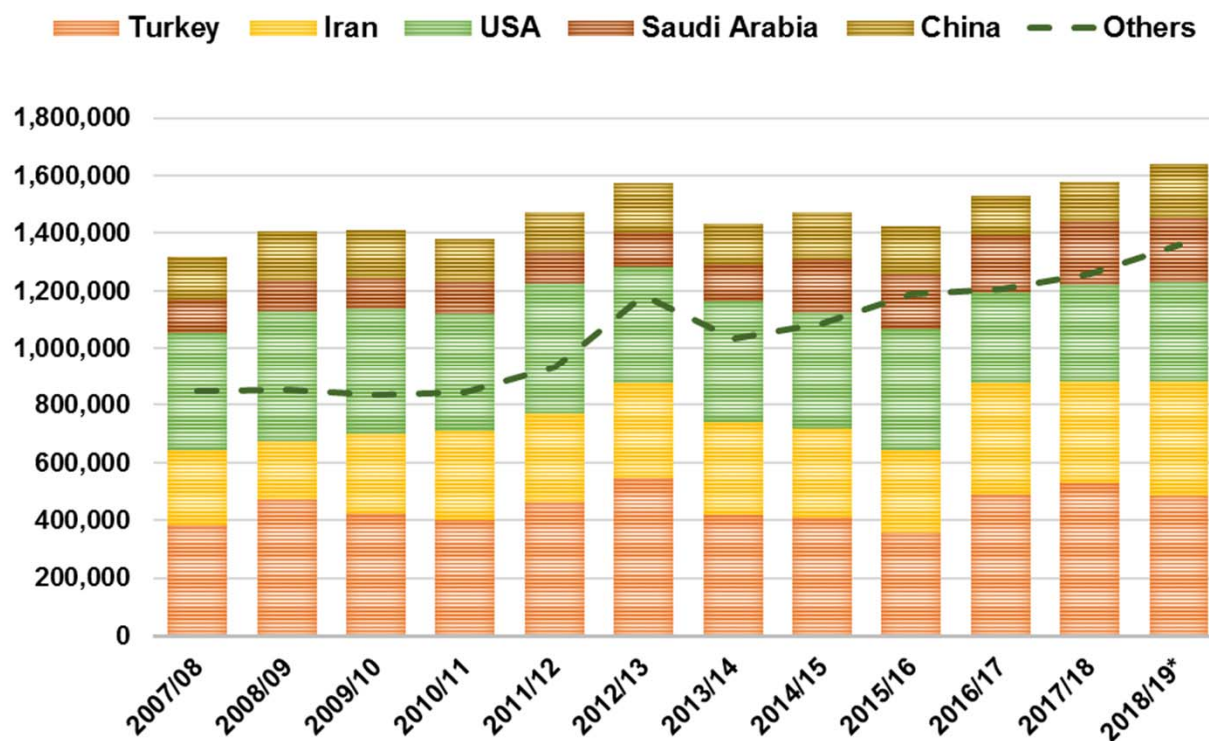
Source: INC



Global Statistical Review- World Dried Fruit Production

World Dried Fruit Production (Metric Tons)

Source: INC

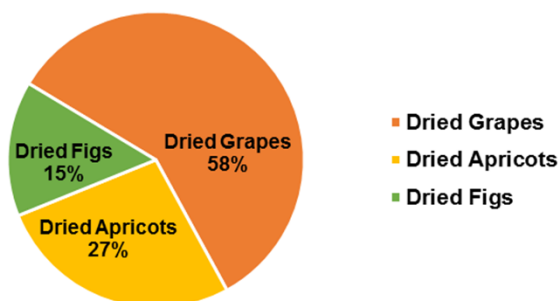


*Forecast

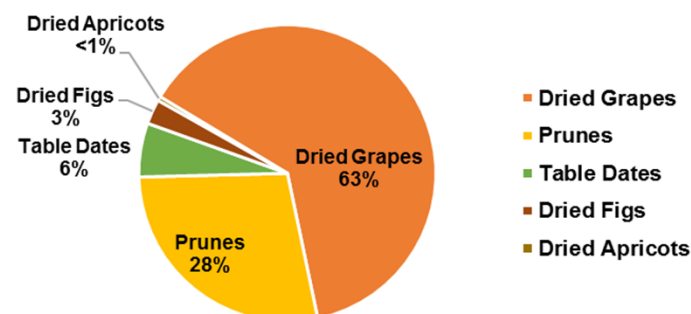
Global Statistical Review- World Dried Fruit Production



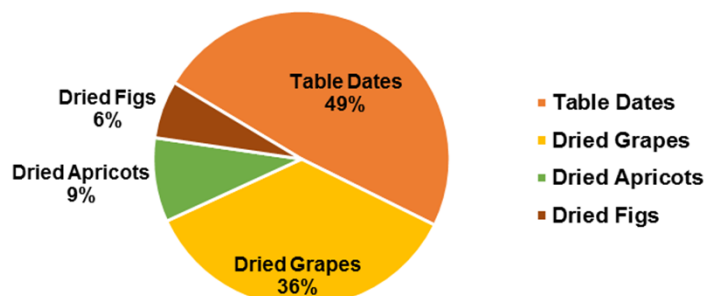
Turkey 2017/18 Dried Fruit Production (Metric Tons)
Source: INC



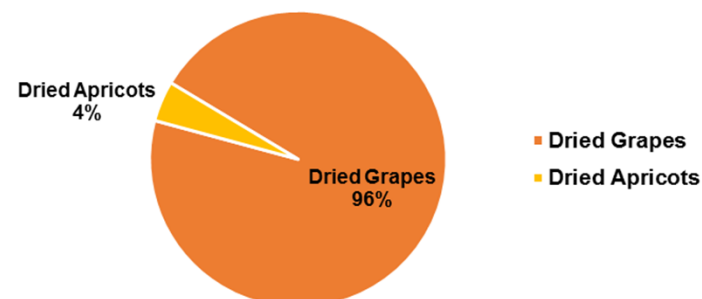
USA 2017/18 Dried Fruit Production (Metric Tons)
Source: INC



Iran 2017/18 Dried Fruit Production (Metric Tons)
Source: INC



China 2017/18 Dried Fruit Production (Metric Tons)
Source: INC



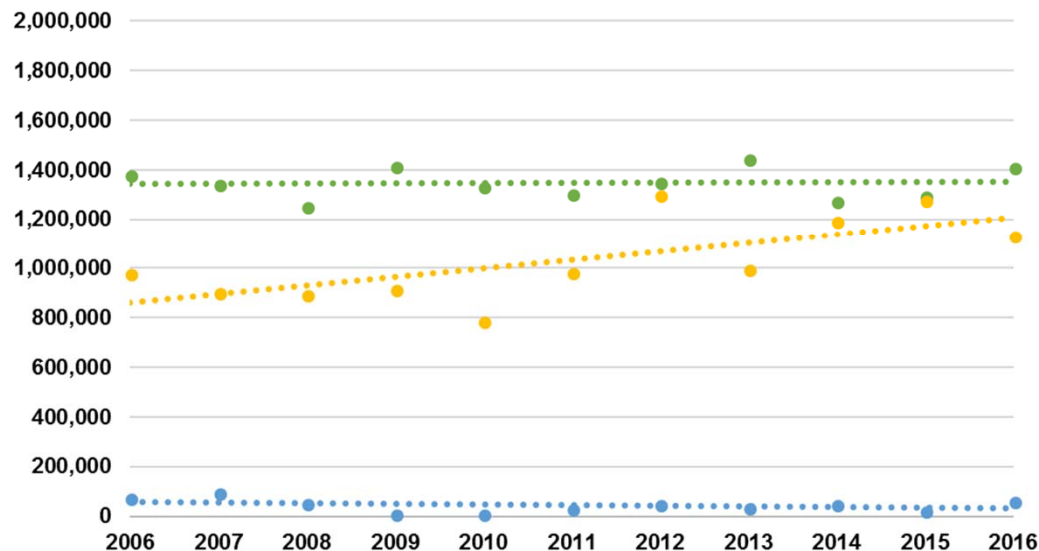
Global Statistical Review- World Dried Fruit Consumption



**World Dried Fruit Estimated Consumption
by GNI* (Metric Tons)**

Source: INC

● High GNI ● Middle GNI ● Low GNI



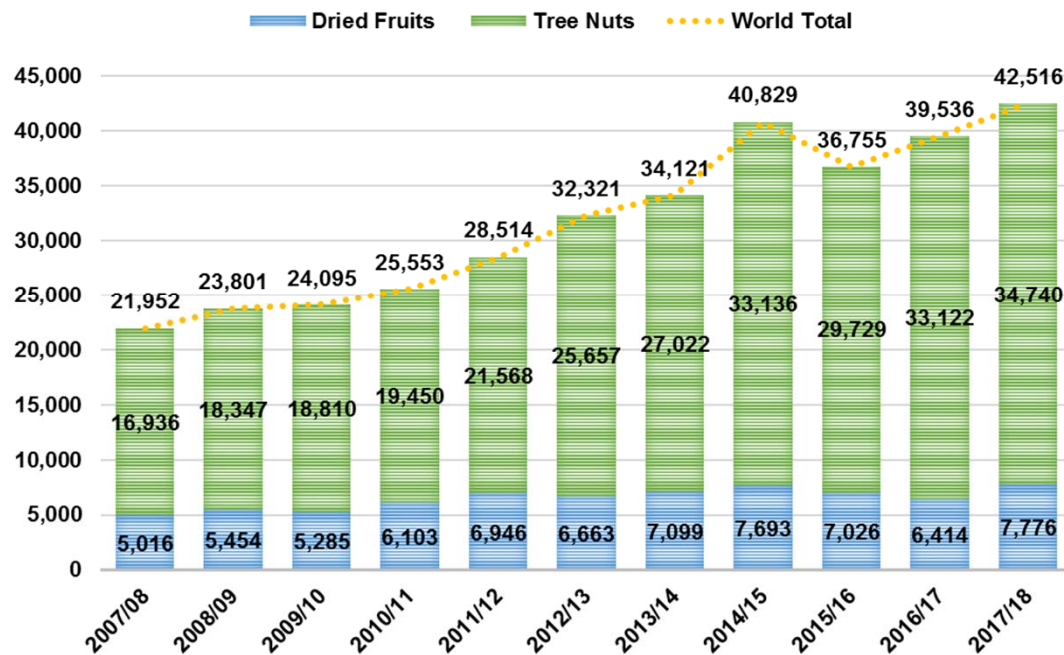
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Global Statistical Review- Supply Value

**Tree Nut and Dried Fruit
Supply Value (Million \$).** Source: INC

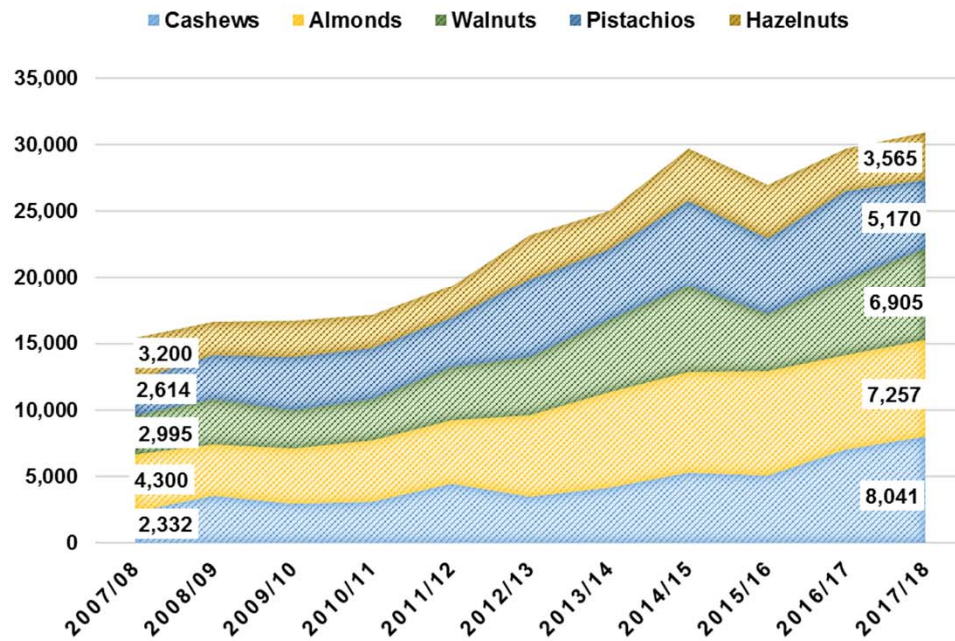


Supply value: estimated as the tree nut and dried fruit production per its unitary price, customs paid upon arrival in Europe.

Global Statistical Review- Supply Value

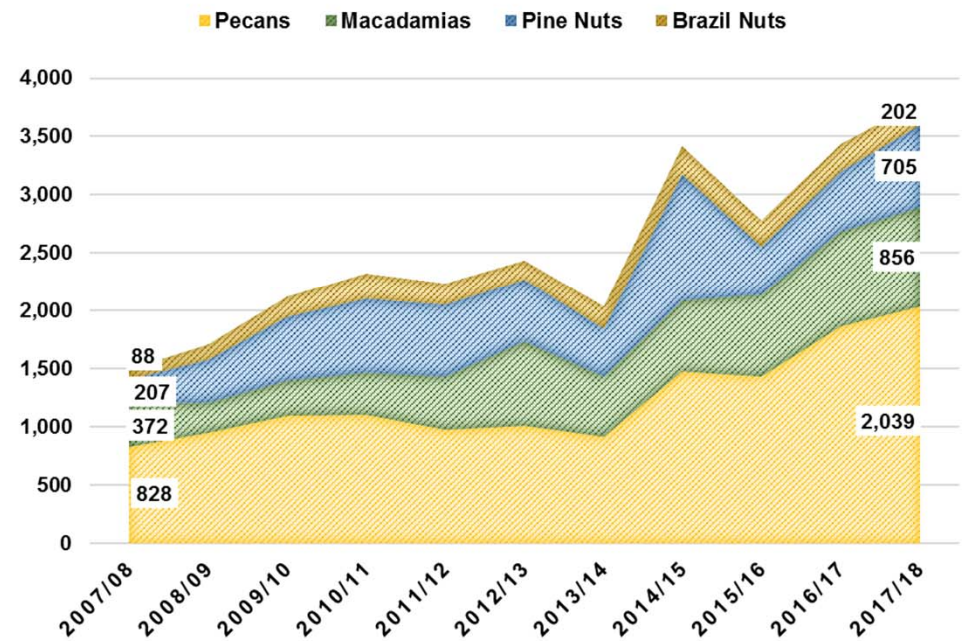
Tree Nut Supply Value (Million \$)

Kernel basis, except pistachios in-shell. Source: INC



Tree Nut Supply Value (Million \$)

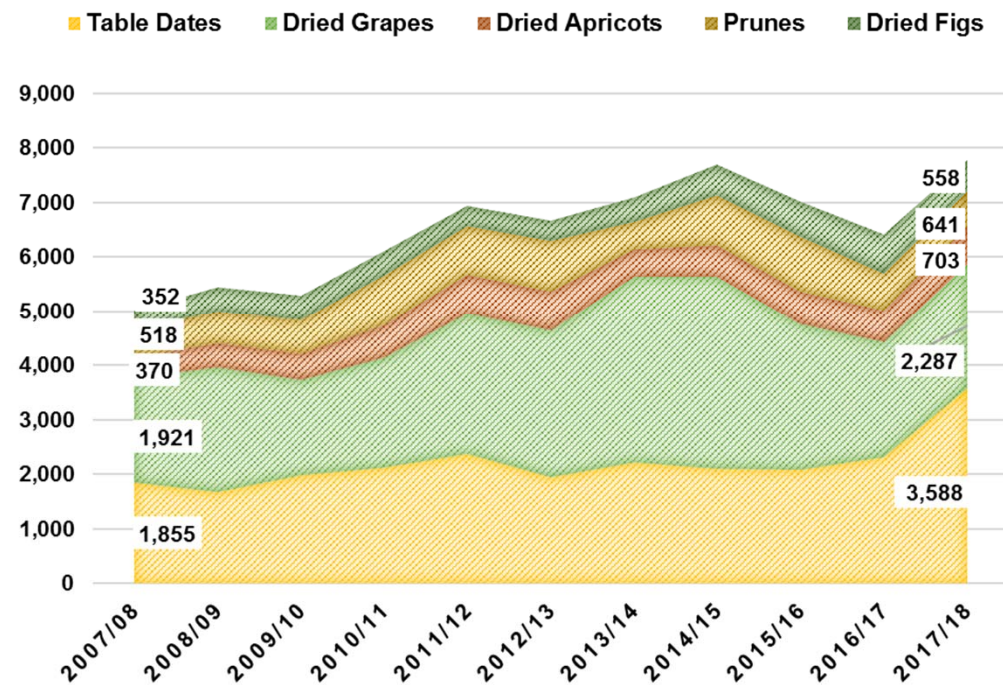
Kernel basis. Source: INC



Global Statistical Review- Supply Value

Dried Fruit Supply Value (Million \$).

Source: INC



Global Statistical Review- Traded Volume

Tree Nut Exports (Metric Tons)	
Almonds	895,928
Cashews	496,019
Pistachios	360,964
Walnuts	219,984
Hazelnuts	209,244
Pecans	60,563
Macadamias	31,187
Brazil Nuts	29,477
Pine Nuts	21,575
World Total	2,324,941

Shelled, except pistachios in-shell

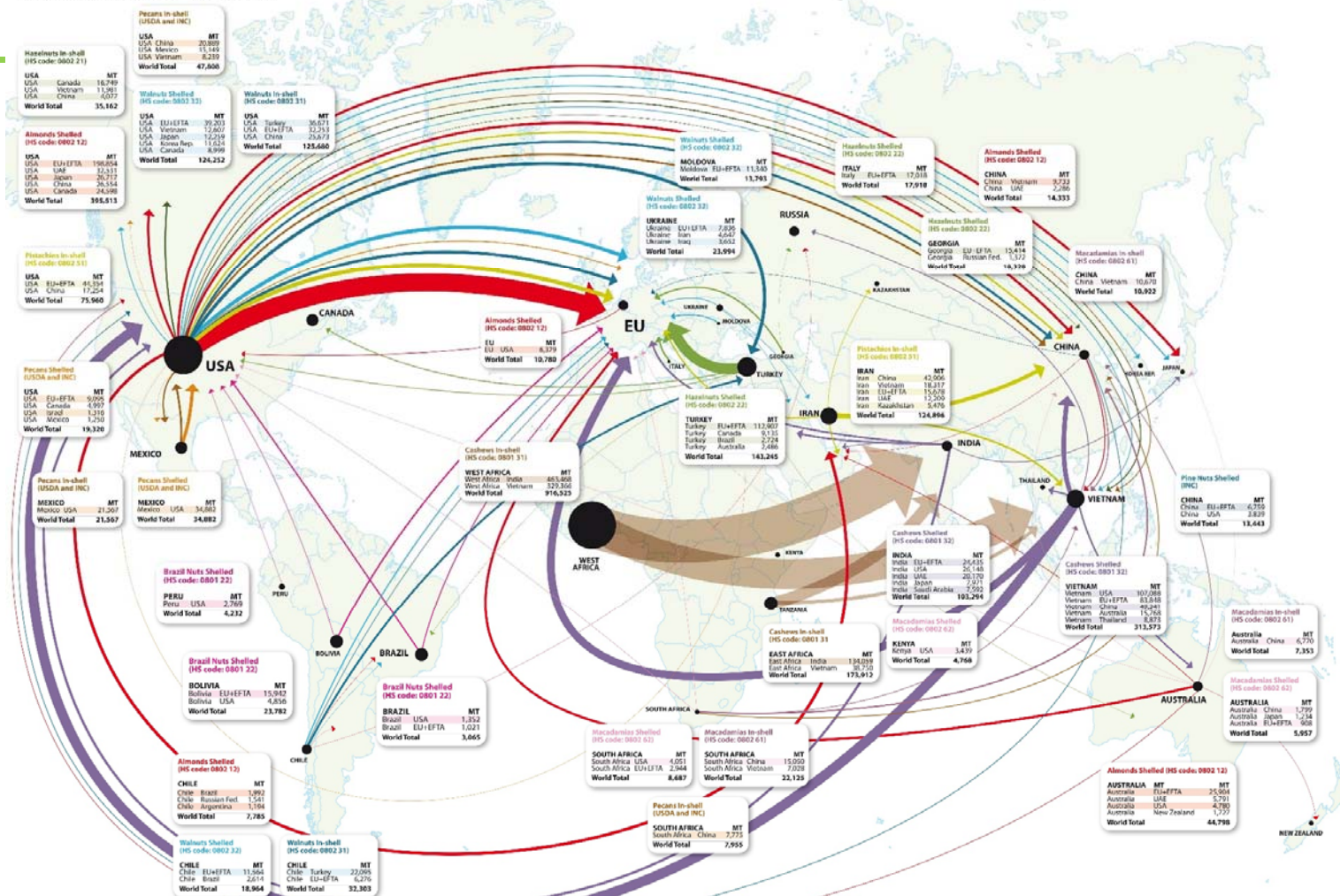
Sources: DESA/UNSD UN Comtrade Database and Eurostat, Comext (2016)

Dried Fruit Exports (Metric Tons)	
Dates	913,327
Dried Grapes	758,071
Prunes	192,775
Figs	124,103
Dried Apricots	95,111
World Total	2,083,386

Annually, over 2.3 million metric tons of tree nuts and 2 million MT of dried fruits are traded around the world.

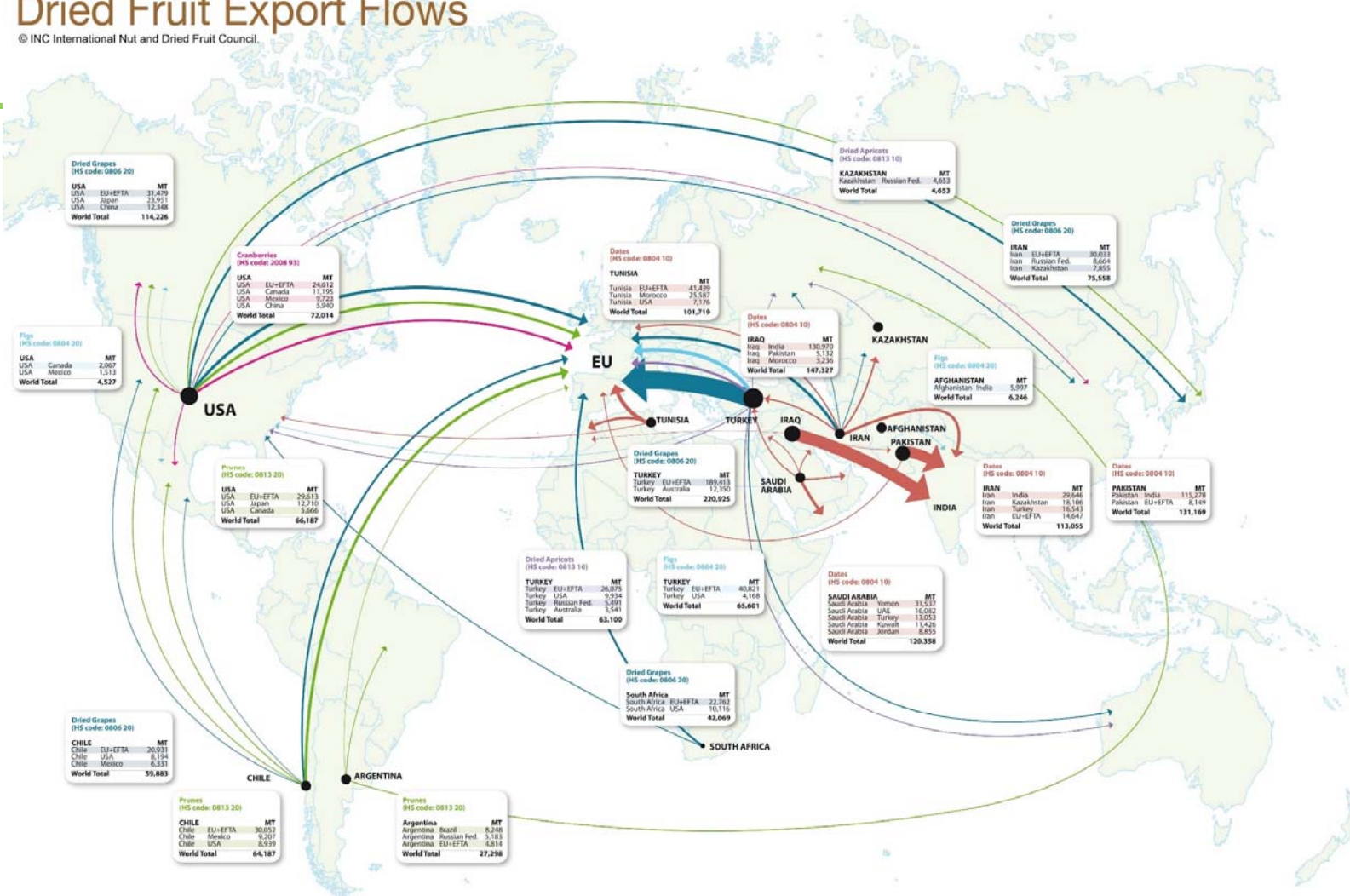
Tree Nut Export Flows

© INC International Nut and Dried Fruit Council.



Dried Fruit Export Flows

© INC International Nut and Dried Fruit Council.



Cranberries are either prepared or preserved (HS code 2008 93).

Global Statistical Review



Almonds support

- **California:** 6,800 farms (75% are 40 ha or less)
- **Australia:** 150 farms (74% family owned of 100 ha or less)
- **Spain:** 100,000 farmers, 2,000 processing employees

Brazil Nuts support

- **South America:** 150,000 people

Cashews support

- **Africa:** 10 million people in 14 countries
- **Vietnam:** +900,000 workers involved in raw cashew nut processing and kernel trade industry

Pine Nuts support

- **China:** 550,000 people
- **Afghanistan and Pakistan:** 200,000 people
- **Russia:** 40,000 people

Dried grapes support

- **Turkey:** 60,000 growers
- **Iran:** 150,000-200,000 people involved

Hazelnuts support

- **In Turkey**
 - 450,000 growers' families and 2 million people involved indirectly
 - 25,000 processing facilities employees
 - 80,000 manufacturing industry employees
 - 12,000 people involved in logistic and distribution
 - 3,000 people involved in trading
- **In Oregon (USA)**
 - 800 growers' families
 - 140 processing facilities employees
- **In Iran**
 - 6,581 people involved in irrigated production
 - 1,890 people involved in rainfed production and 7,561 indirectly

UN Sustainable Development Goals (SDGs)

Food and agriculture can help achieve multiple SDGs



UN Sustainable Development Goals (SDGs)

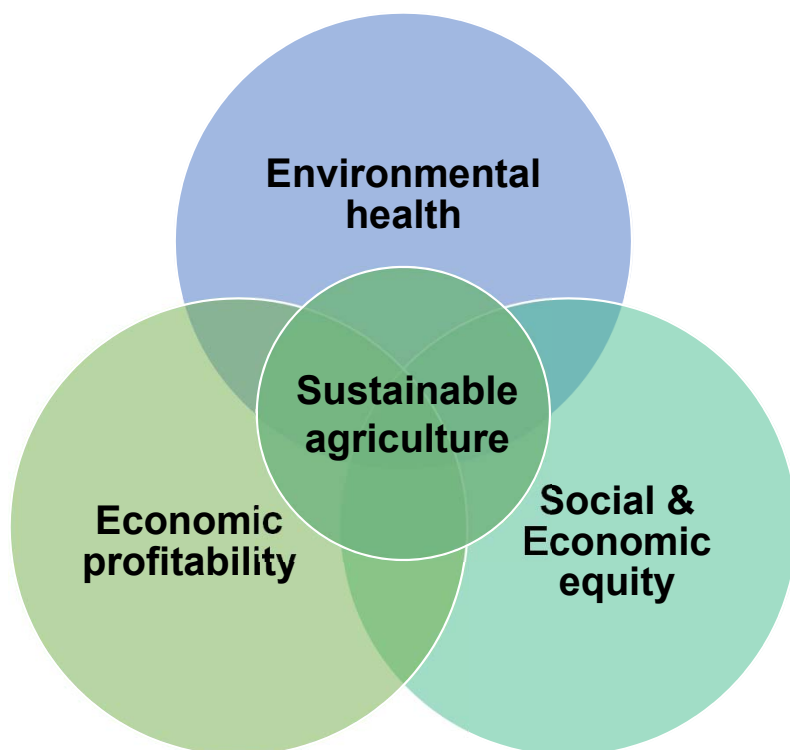
Food and agriculture can help achieve multiple SDGs¹



¹FAO. 2018. Transforming food and agriculture to achieve the SDGs

Sustainable Agriculture

Meet the present needs without compromising the ability to meet future needs



FAO's FIVE KEY PRINCIPLES

- 1** Increase productivity, employment and value addition in food systems 
- 2** Protect and enhance natural resources 
- 3** Improve livelihoods and foster inclusive economic growth 
- 4** Enhance the resilience of people, communities and ecosystems 
- 5** Adapt governance to new challenges 

Sustainable Agriculture



Stewardship of both natural and human resources

Natural resources	Human resources
<ul style="list-style-type: none">• Promote soil health• Promote biodiversity• Minimize water use• Minimize pollution levels	<ul style="list-style-type: none">• Working and living conditions of laborers• Needs of rural communities• Consumer health and safety

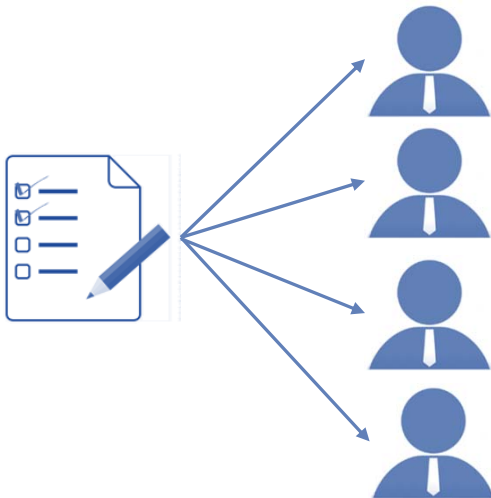
Research: practices more productive and profitable, new varieties

Education: Help growers to adopt sustainable practices

Government: creation of an enabling policy environment, collaboration and stakeholder dialogue.

Megatrends Project

Objective: identify sustainability practices implemented in the tree nut and dried fruit industry



Questions:

1. Which **agricultural practices** towards a more sustainable agriculture have recently been incorporated (or are already part of the agricultural system) in your producing area?
2. Both in irrigated or rainfed agricultural systems, how has **water use efficiency** been improved in your region/country?
3. Is there any **governmental or NGO's programs** in your producing area aiming to achieve gender equality/inclusive, full and productive employment/foster industry innovation and infrastructure?
4. Are **renewable energies** part of your area production systems?

Sustainable Practices



Almonds (USA)	
Agricultural practices	<ul style="list-style-type: none">– California Almond Sustainability Program (CASP):<ul style="list-style-type: none">○ About 23% is assessed using the various CASP self-assessment modules.– What they are doing now is:<ul style="list-style-type: none">○ (1) to finalize a “SAI module” which growers can utilize to see how their practices compare with the SAI assessment.○ (2) to develop an “opt in” system where growers can share data, on an aggregated basis, with their handler.

The screenshot shows the homepage of the California Almonds Sustainability Program. At the top, there is a navigation bar with links: Home, About The Program, Tools & Benefits, Contact, Blog, and a Login button. The main content area features a large image of an almond orchard on the left. In the center, a blue box contains the text: "Welcome to the CALIFORNIA ALMOND SUSTAINABILITY PROGRAM Online System", a "CREATE ACCOUNT" button, and a link "Already have an Account? Login". On the right, there are three smaller images: almond blossoms, a family walking in an orchard, and a close-up of an almond. The California Almonds logo and the CASP logo are also visible.



Sustainable Practices



Cashews (Brazil)	
Agricultural practices	<ul style="list-style-type: none"> – Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss. – Strengthen the means of implementation and revitalize the global partnership for sustainable development.
Water use efficiency	<ul style="list-style-type: none"> – The producers/farmers are trained to use water efficiently. – Brazil suffer a lot with draughts and irrigation is not yet an option (too expensive).
Programs	<ul style="list-style-type: none"> – Government initiative called Embrapa which makes studies to improve the lands and work in new technicians for the cashew culture.
Renewable energies	<ul style="list-style-type: none"> – Only on the processing plants.
Others	<ul style="list-style-type: none"> – Ensure healthy lives and promote well-being. – Ensure education and promote lifelong learning opportunities. – Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all.

Sustainable Practices



Hazelnuts			
	Turkey:	Georgia:	USA:
Agricultural practices	<ul style="list-style-type: none"> – Rejuvenation of the current orchards – Good farming practices. 	<ul style="list-style-type: none"> – Start using improved agricultural practices. 	<ul style="list-style-type: none"> – Growers and industry participate in a sustainability program.
Water use efficiency	<ul style="list-style-type: none"> – As crops are mainly built based on rainfed systems, there is not initiatives towards water use efficiency. 	<ul style="list-style-type: none"> – If irrigation is used, it is primarily a drip system. 	<ul style="list-style-type: none"> – If irrigation is used, it is primarily a drip system.
Programs	<ul style="list-style-type: none"> – There are many independent initiatives. 	<ul style="list-style-type: none"> – Different social projects aiming to achieve gender equality. 	
Others		<ul style="list-style-type: none"> – It is needed to be more productive before going to the next stage which is the sustainable development. 	

Georgia Hazelnut Improvement Project

Sustainable Practices



Macadamias		
	South Africa	Brazil
Agricultural practices	<ul style="list-style-type: none"> – Integrated Pest Management. – Water management. 	
Water use efficiency	<ul style="list-style-type: none"> – Low flow drip irrigation – 50% less water is now used. 	
Programs	<ul style="list-style-type: none"> – The South African Cabinet has approved a new minimum wage bill that would see that workers will earn more market-related salaries. 	<ul style="list-style-type: none"> – Brazilian work law ensures gender and race equality/inclusive. – Brazilian Forest Code, there is a national law which requires that 20-80% (depending where it is situated) of the farms to be native forest.
Renewable energies	<ul style="list-style-type: none"> – Solar power. 	<ul style="list-style-type: none"> – Macadamia's shells are burnt to generate heat. – Solar heat is used to dry nut in-shell.
Others	<ul style="list-style-type: none"> – Through funds that SAMAC has received from Farmers and Handlers, it is able to provide bursaries for previous disadvantaged students and assists upcoming farmers. 	

Sustainable Practices



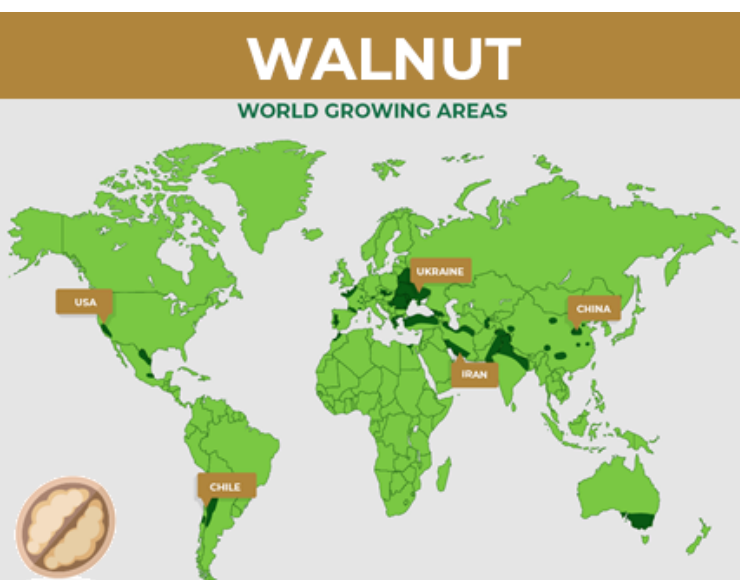
Pecan			
	USA	South Africa	Australia
Agricultural practices	<ul style="list-style-type: none"> – Conversion from flood irrigation to sprinkler and micro sprayers. – Less use of round-up herbicide. – More use of composted manure. 	<ul style="list-style-type: none"> – Global Gap is implemented in some areas 	<ul style="list-style-type: none"> – Integrated Pest Management program – Pesticide free. – Upgrade Irrigation to improve efficiency. – More drip developments over flood. – Fertilizer program (only when is required). – Mulching as an alternative to conventional pruning waste management.
Water use efficiency	<ul style="list-style-type: none"> – More use of sprinkler vs. flood irrigation. 		<ul style="list-style-type: none"> – Irrigation monitoring system. – Drip upgrades.
Programs		<ul style="list-style-type: none"> – Government Land Redistribution Program 	<ul style="list-style-type: none"> – Government programs for industry innovation and infrastructure.
Renewable energies	<ul style="list-style-type: none"> – Pecan shell. – Solar energy on farms and in production facilities. 		<ul style="list-style-type: none"> – Solar energy.
Others			<ul style="list-style-type: none"> – Education opportunities through government funded programs.


Sustainable Practices



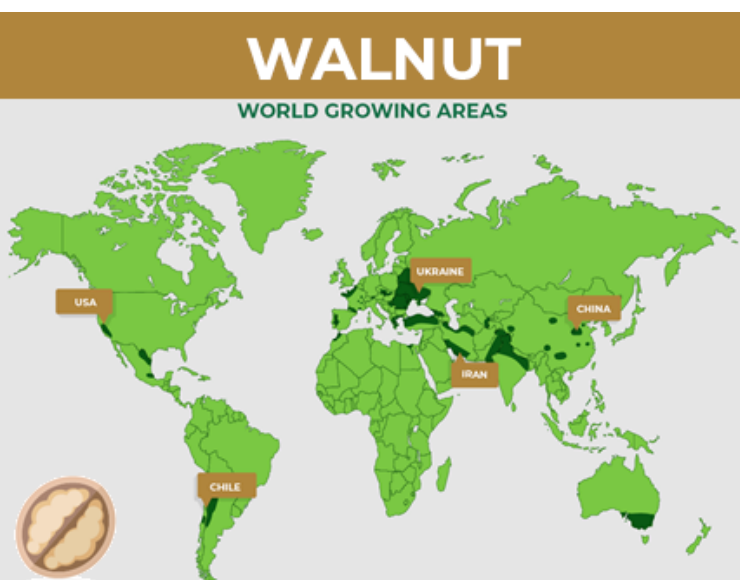
Pistachios (USA)	
Agricultural practices	<ul style="list-style-type: none"> – Installation of fuel cells. – New pistachio varieties more efficient (same water – 30% higher yield). – Hull bio-matter is recycled as cattle feed.
Water use efficiency	<ul style="list-style-type: none"> – Agricultural waste water is recycled back on to the orchards as agricultural irrigation water.
Programs	<ul style="list-style-type: none"> – Investments in far-reaching community development, education, and health and wellness programs across California's Central Valley, all with the goal of enriching and enhancing the lives of employees, their families and their communities. – Infrastructure improvements. – Affordable single-family homes.
Renewable energies	<ul style="list-style-type: none"> – Solar energy in processing facilities. – Pistachio shells are sold to electrical utilities.

Sustainable Practices



Walnuts			
	China:	USA:	Chile:
Agricultural practices	<ul style="list-style-type: none"> – Mechanical harvest for commercial orchards, especially for hulling and drying. – To provide technics for farmers/growers in the area of irrigation, variety and management etc. 	<ul style="list-style-type: none"> – Their commitment to sustainability is deeply rooted. – Informed by science and advanced with the help of new technologies and innovations to reduce the impacts on the environment. 	<ul style="list-style-type: none"> – APL (Clean Production Agreement) is being developed to achieve sustainability at the orchards and processing facilities. 
Water use efficiency	<ul style="list-style-type: none"> – Drip irrigation system in flat areas. 	<ul style="list-style-type: none"> – Continuous improvements to lessen the impacts. 	<ul style="list-style-type: none"> – Improvements in irrigation systems.
Programs	<ul style="list-style-type: none"> – Government policy to get rid of poverty and to achieve prosperity for the poor areas and regions. – Policy for equality between man and woman. 		<ul style="list-style-type: none"> – There is a special office called FIA, an organism focused on promoting innovation programs for the industry.
Renewable energies			<ul style="list-style-type: none"> – Solar energy (only some companies).

Sustainable Practices



Walnuts		
	Moldova	Italy
Agricultural practices	<ul style="list-style-type: none"> – Cultivating lands using no-till/mini-till technologies. – Cultivating by using the sustainable lands management practices. 	<ul style="list-style-type: none"> – Sexual Confusion to reduce the use of pesticides. – Measurement of light with a Photosynthetically Active Radiation system to decide exact pruning and foliar feeding.
Water use efficiency	<ul style="list-style-type: none"> – Extension of irrigated agricultural lands-renewed centralized irrigation systems- by dripping -by spraying. – The project "Improvement of the water supply infrastructure in the central region of the Republic of Moldova" is in under way. 	<ul style="list-style-type: none"> – Pressure Chamber to determine the exact quantity of water for irrigation.
Programs	<ul style="list-style-type: none"> – The National Program for Gender Equality for 2016-2020. – The National Employment Strategy for the period 2017-2021. 	
Renewable energies	<ul style="list-style-type: none"> – Current energy efficiency projects under the "Energy and Biomass in Moldova" Project. – The subsidy program for biomass boilers has been launched. 	<ul style="list-style-type: none"> – Solar energy.

Sustainable Practices



Dates (Tunisia)	
Agricultural practices	<ul style="list-style-type: none"> – Protection of date bunches by nets makes possible to avoid chemical treatments against insects. – Almost all farmers use organic fertilizers.
Water use efficiency	<ul style="list-style-type: none"> – Increased use of localized irrigation especially in new plantations
Programs	<ul style="list-style-type: none"> – Government incentives for investment and job creation in production areas. – Existence of NGOs working in the field of gender equality and inclusive employment.
Renewable energies	<ul style="list-style-type: none"> – Increment in the use of solar energy for pumping water.



Sustainable Practices

DRIED APRICOT

WORLD GROWING AREAS



DRIED FIG

WORLD GROWING AREAS



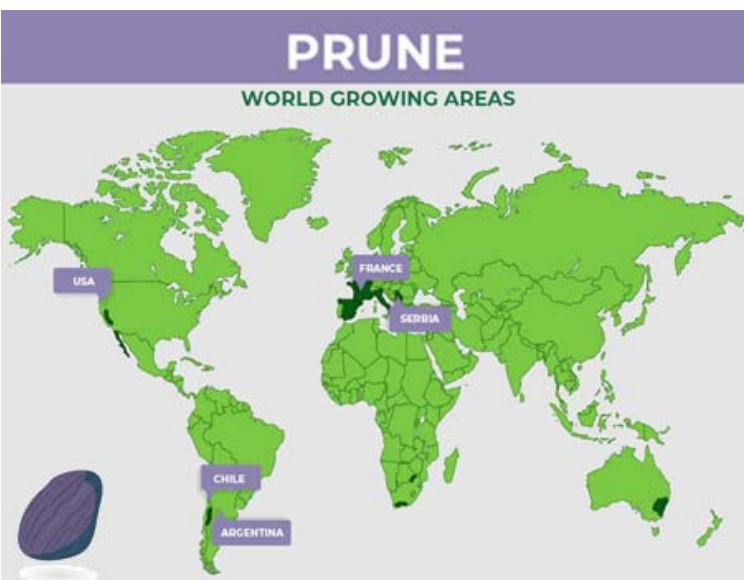
Dried Apricots (Turkey)

Agricultural practices	– Organic production and Good Agricultural Practices have been incorporated in our producing area
Programs	– There are government and NGOs support for Women, young and disadvantaged entrepreneurs.
Renewable energies	– Turkish dried apricots naturally dried under the sun. – Solar energy is used in some production facilities.

Dried Figs (Turkey)

Agricultural practices	– Organic production and Good Agricultural Practices have been incorporated in our producing area.
Water use efficiency	– Irrigation Ponds have been built in dried fig production area.
Programs	– There are government and NGOs support for Women, young and disadvantaged entrepreneurs.
Renewable energies	– Turkish dried apricots naturally dried under the sun. – Solar energy is used in some production facilities.

Sustainable Practices



Prunes (USA)	
Agricultural practices	<ul style="list-style-type: none"> – Soil health management. – There is a focus on tree health and improvement through research studies to advance the sustainability of the trees.
Water use efficiency	<ul style="list-style-type: none"> – Utilization of technologies to monitor the soil moisture content in order to effectively irrigate orchards. – Improved irrigation techniques.
Renewable energies	<ul style="list-style-type: none"> – Solar power. – Reducing the amount of energy by recycling steam in our plants.
Others	<ul style="list-style-type: none"> – Utilization of by-products for cattle feed. – Deriving the natural oil from the pits that has multiple uses. – Installation of high efficiency lighting in the plants to reduce electricity usage. – Recycling packaging waste – reducing landfill. – Lightweight packaging – over 10% reduction in tree fiber consumption. – Converting packaging to 100% recyclability. – Excellent employee working conditions.

Sustainable Practices



Dried Grapes			
	Turkey:	Chile:	USA:
Agricultural practices	<ul style="list-style-type: none"> Organic production and Good Agricultural Practices have been incorporated in our producing area. 	<ul style="list-style-type: none"> Global Gap. Some growers have made investments for the proper use of water and energy. 	<ul style="list-style-type: none"> Higher minimum wage. Equal opportunity, many female workers. Public education is available to everyone. Children must attend school and are not allowed to work. Mechanical Harvesting which provides more year-round work at higher wages.
Water use efficiency	<ul style="list-style-type: none"> Irrigation Ponds have been built. 	<ul style="list-style-type: none"> Drip irrigation (90% growers). 	<ul style="list-style-type: none"> Drip irrigation. Water management programs.
Programs	<ul style="list-style-type: none"> Government and NGOs support for women, young and disadvantaged entrepreneurs. 	<ul style="list-style-type: none"> Governmental initiative for employing a % of disabled people. 	<ul style="list-style-type: none"> Economic Employment Opportunity Commission.
Renewable energies	<ul style="list-style-type: none"> Turkish dried apricots naturally dried under the sun. Solar energy in some production facilities. 	<ul style="list-style-type: none"> The government launched a national wide program to develop solar energy. 	<ul style="list-style-type: none"> Solar energy. Hydroelectric power.

To sum up:

- There are big differences between countries in terms of sustainability.
- Farmers became more aware of their positive impact in both the environment and the crops.
- In general, water use efficiency is being improved through more efficient irrigation systems.
- Concerning renewable energies, solar power systems (photovoltaic panels) are being implemented in farms and production facilities all over the producing countries. Furthermore, nut shells are being used as biomass fuel for power generation.
- By-products (e.g. husks) are being repurposed as cattle feed, reducing waste and indirectly, CO₂ emissions.

Challenges on Sustainability

**Labor
standards**

Low yields

**Climate
change**

Transparency

Conclusions

Making the transition to sustainable agriculture is a process that requires a series of small and realistic steps.

Each small decision can make a difference and contribute to advancing the entire system.

The key to moving forward is the will to take the next step



Thank you.



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