pro|CHILE

Chile
All Ways Surprising

Innovation in the Chilean Fresh Fruit Industry: A driver for the best response to market

FRESH FRUIT
FRUTA FRESCA
FRISCHES OBST
FRUITS FRAIS
CHILE

ASOEX
ASOCIACION DE EXPORTADORES DE CHILE A.G.
"Juntos, nuestra fruta vale más"

FDF
FUNDACIÓN PARA EL DESARROLLO FRUTÍCOLA

Traditionally the Chilean Fresh Fruit Industry has been strongly focused in the effort of delivering a full supply of fresh fruit in terms of volume and variety, with good quality and timely as needed by the market.

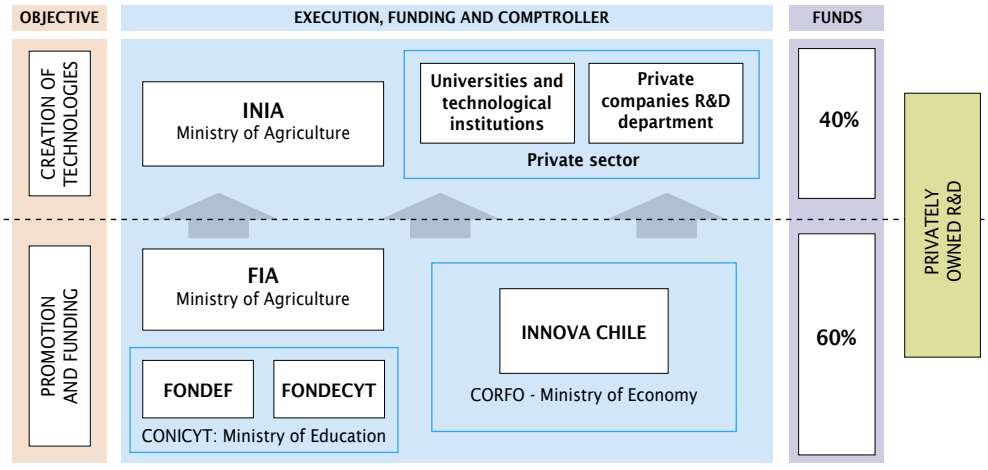
Accordingly in Chile, the innovation in this sector has been mainly geared into in two research areas:

- To adapt new species to the productive agroecological conditions of the country and
- To increase productivity.

At present the Industry, considered a key part of the Chilean strategy for development and innovation, has assumed new challenges including:

- To develop new fruit varieties
- Advances in packaging
- Increase environmental care

R&D actors in the innovation system for the Chilean Fruit industry



Source: Ministry of Agriculture, Modified by FDF.

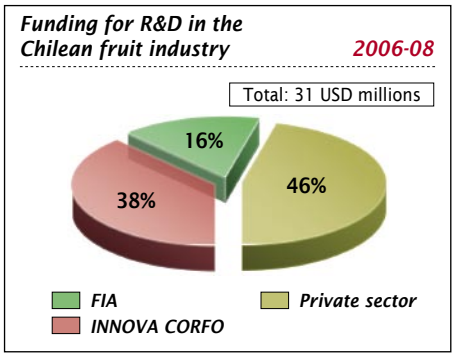
1 HOW IS INNOVATION MANAGED IN THE CHILEAN FRUIT INDUSTRY?

The Chilean Innovation system for the fruit industry is a good example of dialogue and collaboration between public and private sectors. Initiatives or requirements about R&D can originate from both sectors and funding is usually a joint effort, particularly in areas where advanced technologies are required.

The public agencies associated to the task of promoting and funding agricultural research in Chile are Fundación para la Innovación Agraria, FIA (Ministry of Agriculture), INNOVA Chile from Corfo that depends from the Ministry of Economics) and Fondef and Conicyt, that depends from the Ministry of Education. A strong audit system is made by these institutions, both financially and technically, to supervise the correct execution of the project.

The sector has its own R&D/ Technology and extension institution, (Fundación para el Desarrollo Frutícola, FDF) and is well connected with most of the Universities and research centers. There are 20 Agriculture Faculties, being the oldest ones those dependant of the University of Chile, Catholic University and Valparaíso Catholic University, and several specific centers such as Centro de Pomáceas for R&D in Pomme industry, and Experimental Stations from Instituto de Investigaciones Agropecuarias, INIA.

Total spending for R&D projects associated with fruit industry for the period 2006-2008 has been app. 31 USD millions of which 12 millions were provided by the private sector.



An especial case of direct participation of the fruit industry in innovation management: FDF

FDF is a private, non profit, scientific and technical institution focused at collaborating with the industry needs in the area of research and extension.

It was created in 1992, with the purpose of joining efforts and resources to solve some specific technical problems related with some quality and post harvest issues/problems affecting the industry.

Its associates, (41 companies), represents approximately 70% of all fresh fruit exports. Additionally the institution provides services to 380 producers directly and more than 3000 via their exporters. In its 17 years FDF has managed over 50 major R&D projects with a total direct spending of over 30 million dollars

The current main action lines for R&D in FDF are:

Some results of the R&D work of FDF include:

- Development of packing material for the technical requirements for the exports of cherries
- Development of the agroclimatological Chilean net
- Study of the biological cycle of pests for kiwi fruit
- Study of new alternative methods for pest control in table grapes
- Development of predictive models for Cydias spp.
- Development and administration of ChileGAP®

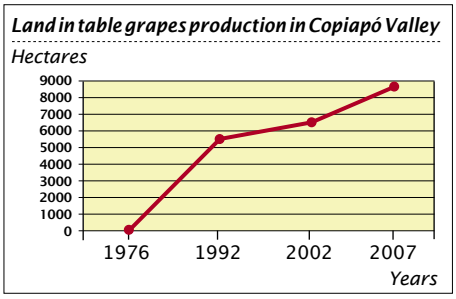
2 A CASE OF ADAPTATION TO EXTREME AGROECOLOGICAL CONDITIONS

Copiapó Valley is located along the Copiapó river. The ecological conditions are a poor soil, high temperatures and lack of water. Normally, rain along the whole year is negligible.

Maximum temperatures in summer: 38º C	Rain in milimeters per year: 1 milimeter (average last two years).	Heat Units (Degree days base10): 2500 per year.

Before 1978, this Valley had limited agricultural activity, for local consumption only. However, that same year a group of innovators, made the first tests to adapt table grape production to these lands.

From zero production during the seventies, today the Copiapó Valley has over 8.700 hectares producing table grape, being one of the earliest fresh table grape to be delivered to the market in mid December every year.



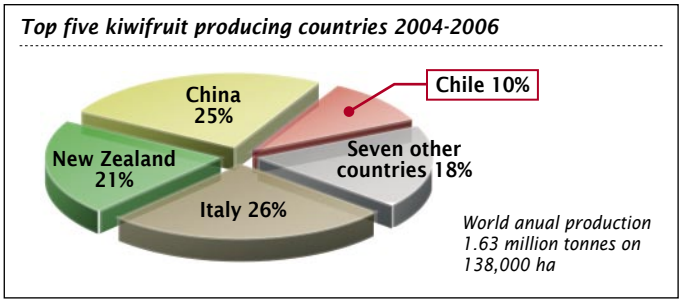
Source: Ciren

Establishment of a new vineyard in the arid conditions of the Copiapó Valley.

Innovation has been applied for the use of new agricultural techniques, new drip irrigation methods, and precise control of water and fertilization. Production techniques that today seems to be common practices, in those years were real innovations.

Other cases of adaptation of new species to increase the productive portfolio offered by the Chilean fresh fruit industry:

1. Kiwi: from zero hectares in 1980 to 7000 hectares in 2003. Nowadays Chile is one of the top five kiwi producers in the world.



Source: World Kiwifruit Review 2007

2. New species recently adapted to Chilean conditions:

- Blueberries
- Clementines
- Cranberries
- Marionberries

3 CASES OF R&D IN FRESH FRUIT PRODUCTION

One of the drivers of R&D in Chile has been to fulfill the markets needs in terms of quality and volume.

Some cases recently developed for responding to those requirements are:

Food safety

ChileGAP®: The Chilean GAP program has a unique innovative feature: It is the only Program worldwide that has reached a benchmarked status with European GAP Standard (GLOBALGAP) and US GAP Programs (NSF Davis Fresh) and currently working to obtain recognition with ChinaGAP.

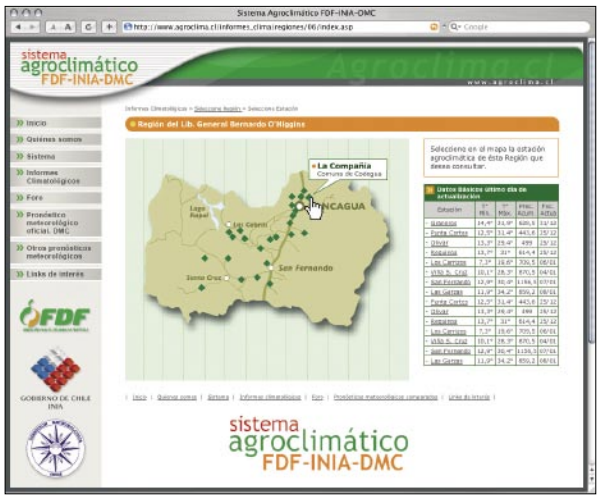
Pesticides Agenda: A periodic publication issued by Chilean Exporter's Association (ASOEX) that collates the MRL for all the markets, by species and associates that MRL with the pre harvest interval. This publication is an extremely valuable tool for growers, in order to decide the use of Plant Protection Products according to the markets where their product is intended to be traded.

Production management:

Agroclimatic Net: This is a development that pioneered the use of climatic information for productive management. As far back as 1998, research was done to build predictive models on pests.

Today, the Agroclimatic Net:

- Is a joint private-public service between public and private agencies (FDF, INIA and DMC) with more than 100 automatic weather stations through out the country.
- Provide via Internet (in real time) the main parameters to evaluate the most important events on fruit crops like: Growing degree hours, Chilling hours, Phenology Stages development (by Varieties), etc.
- Includes some forecast models for: freezes alarms, phenology stages for pests and cultivars, expected harvest dates.
- At the end of this year more than 200 Automatic Weather Stations and a new modern software and transmission system for mobile phones, will be in place.
- In changing conditions, sun burn damage in the fruit must be monitored. Models for sun burn are in validation process.



www.agroclima.cl

4 CASES OF R&D IN FRESH FRUIT PRODUCTION

Thermal Pest Control®

TPC® is a new technology developed in Chile for the control of pests and diseases in tree fruits, vegetables and vineyards. Their principle is a blast of heated air at high speed hitting the foliage of plants, apparently triggering the self defense system of the plants. The heated air is very dry, it apparently dehydrate the larvae and susceptible insects, fungus, etc. The method and the machine are protected by patents in 27 countries.

Environmentally safe and clean, air is heated through the use of LPG, and through a powerful fan with special aerodynamics, is directed to the foliage of the plants.

Savia Grapes®

Savia Grapes® is a natural formulation that duplicates the natural savia that feeds the fruits. This formulation is encapsulated in a cap that is inserted in the bunch immediately after harvest, before cicatrization of the cut begins.

The **Savia Grapes**® contents (carbohydrates, aminoacids, water and mineral salts) avoids dehydration of the fruit maintaining the freshness and quality once harvested, during transport, and in the market.

New varieties in Grapes and Murtilla

After a long research, INIA, the technological agency of the Ministry of Agriculture has developed three new varieties of grapes: A Muscat (Alba Rosa) and two white seedless grapes (Ilusión and Isela), rounded shape that have a better ripening condition, yield and long post-harvest life.

Murtilla is a native berry type fruit with high antioxidant content, having a special potential for specific markets. The new varieties, Red Pearl and South Pearl have been developed by INIA looking for to improve yield maintaining a consistent quality of the fruits and a good post harvest life.

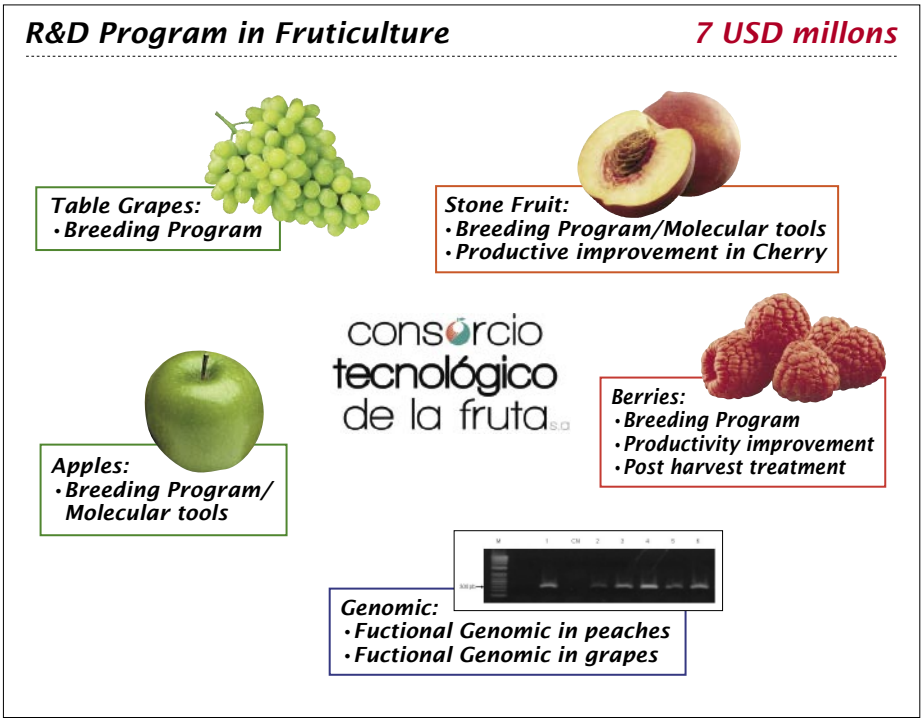
5 TECHNOLOGICAL CONSORTIUMS

Technological Consortiums are a new initiative created by public and private agreements in order to develop specific R&D activities under a business model.

The specific Consorcio Tecnológico de la Fruta S.A. is a long term association between 27 fruit producers and exporters companies, the Catholic University of Chile and the Chilean Exporter's Association, ASOEX. Funding is provided by all the members and FIA, the R&D Agency of the Ministry of Agriculture.

Their mission is:

- To develop knowledge, scientific capabilities, technologies and process for developing products and services for the fresh fruit industry.
- To develop new fruit varieties according to consumer's preferences, market's requirements and adapted to local production conditions and logistics.
- To protect and commercialize the products obtained through its research under different licensing models.
- To add value to our products in international markets.



Chile
All Ways Surprising

pro|CHILE

More information:

Asociación de Exportadores de Chile, A.G.
www.asoex.cl

Market Intelligence System
www.simfruit.cl

Chilean Fresh Fruit
www.chileanfreshfruit.com

Fundación para el Desarrollo Frutícola
www.fdf.cl

Chilean agroclimatological net
www.agroclima.cl

ProChile
www.chileinfo.com

Agrocap
www.agrocap.cl

FRESH FRUIT
FRUTA FRESCA
FRISCHES OBST
CHILE
FRUITS FRAIS

ASOEX
ASOCIACIÓN DE EXPORTADORES DE CHILE A.G.
"Juntos, nuestra fruta vale más"

FDF
FUNDACIÓN PARA EL DESARROLLO FRUTÍCOLA