

MODERN CULTIVATION OF THE PISTACHIO TREE



AUGUST 09



VALSECO

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1. THE CONCEPT

- ✓ Development of the pistachio tree with the latest farming technology: underground watering, plant grafting, nutritional control
- ✓ Production of pistachio from plantations with a high level of management and mechanization
- ✓ Driving the development of the Spanish-International market for pistachio, providing a high quality national product of guaranteed food-value, with an optimal price/quality ratio.
- ✓ The creation of an industry that is closely linked to the farm, which makes it possible to ensure quality and traceability of the product
- ✓ Viable alternative to traditional cultivation
- ✓ Higher profitability than that obtained with other traditional alternatives (corn, beets, tomatoes) and trees (olive, almond)
- ✓ Lower consumption of natural resources (fertilizers, water)
- ✓ Positive environmental impact



2. VALSECO AND ITS MAJOR PROJECTS

- Valseco is engaged in agro-industrial projects based on the cultivation of olives, nuts, pistachios and Paulownia.
- Valseco is driving the search for investor partners seeking those who meet the following criteria:
 - Interested in improving their rural farming enterprise
 - Interested in investing in agribusiness
 - Seek a management company and alliances to carry forward the implementation, maintenance and operation of the Project
 - Share the idea of innovation in this sector, based on investor effort and natural resources to produce the goods, products and services demanded by today's society with a higher yield of value added for their professional effort and investment
 - Seek profitability based on the real productivity of projects that work without major fluctuations, or financial bubbles that give rise to unexpected consequences due to changes in the world economy.

3. VALSECO-CASA SANT ROC

VALSECO:

- **Function:** Extensive experience in Project implementation. Supplies, consulting and maintenance of plantations, own technology, production of selected trees, plant grafting.
- **Operations:** First plantings carried out in Toledo in 1995
- **Market:** Spain. Exportation in the future
- **Surface area:** Own facilities: Office 400 m2. Warehouses 2,000 m2, laboratory, experimental farms
- **Collaborations:** Spanish Universities for R&D&I
Madrid Schools of Agricultural Engineers and
Albacete School of Agronomy Engineering



3. VALSECO-CASA SANT ROC

CASA SANT ROC:

- **Function:** Rootstock Nursery
- **Experience :** More than 20 years of cultivation in Spain
- **Operations:** Production of plant grafts, selected trees
- **Market:** Spain. Exportation in the future
- **Surface area:** 5,000 m2 of nurseries and greenhouses
- **Collaborations:** Spanish Universities - California for R&D&I.



4. THE PISTACHIO TREE (BOTANICAL CHARACTERISTICS)

BOTANICAL CHARACTERISTICS:

- The pistachio tree can grow as high as 7 to 10 meters, and is very long-lived: from 150 to 300 years according to various authors
- It is a dioecious tree, which is to say, there are separate male and female trees.
- It has a grey, wrinkled bark, with abundant branching and a dense crown
- Its root system reaches to great depth, and this makes it resistant to dry climates, it can grow in a wide variety of soils such as calcareous, alkaline, slightly acidic, saline, etc.
- The bark of the twigs is of a reddish yellow colour, ash-grey in the younger parts and dark grey in the older parts.
- A size of 5-7-9 meters in height, with an open habit, that tends to lean over so that initially it may require the use of props to hold it up.
- The trunk is usually short and the bark wrinkled and grey in colour, with abundant branching and a dense crown.



4. THE PISTACHIO TREE (BOTANICAL CHARACTERISTICS)

BOTANICAL CHARACTERISTICS:

- **The root system:** is penetrating and superficial. It penetrates to great depth seeking water and nutritive salts, and because of this it can succeed in soils where other species do not thrive. When its surface roots are numerous, the tree is more vigorous, its crown develops well, providing greater fruition with regularity, chiefly depending on the availability of water and nutrients.

- **The leaves:** are pinnate, with 3 or 5 folioles, lanceolate or oval, subcoriaceous, dark green in colour on the face, and more pallid on the underside. The foliage quickly turns red-orangish in the fall, and is of striking appearance.



4. THE PISTACHIO TREE (BOTANICAL CHARACTERISTICS)

BOTANICAL CHARACTERISTICS:

- **Flowers:** Because it is a dioecious plant, the male and female flowers are found in different trees. They are small, of a green-tannish hue, and appear in bunches or axillary panicles. The flowers blossom on short lateral branching stems, before the budding of the leaves, they develop in the previous year, from buds located in the axilla of the leaves of the stems that are growing.
- **The fruit:** A monosperm drupa rich in oil, 0.2 to 2.5 cm in length, oval, dry, with a hard, smooth shell. The seed is the edible part, made up of voluminous cotyledons of a green or yellowish green colour with a reddish tegument. Its weight is approximately 1.40 grams.
- **Pollination:** Pollination is via anemophily. In the plantation, male and female trees should be placed at a ratio of one to eight or ten, respectively, although there is no fixed rule in this regard. The number of males will also be limited on the basis of what types of males are planted, and whether it is irrigated or dry land.



4. THE PISTACHIO TREE (HISTORY)

- The first references to this crop are from the 6th century B.C., when peoples such as the Persians were already consuming this product.
- In 30 B.C. it is introduced into Rome and Sicily, and from 14 to 37 A.D. it is brought to Spain.
- During the Arab occupation it became a regularly cultivated crop, spreading through many Mediterranean regions.
- In Spain one of its most important moments takes place during the Middle Ages.
- Subsequently it ends up disappearing, due to the surge of traditional crops such as olives and cereals
- In 1988, the first seedlings are imported into Castile-La Mancha through the *Centro de Mejora Agraria El Chaparrillo* (the El Chaparrillo Centre for Agricultural Improvement in Ciudad Real) which marks the start of its specialized study in this region.

4. THE PISTACHIO TREE (CURRENT OVERVIEW)

THE SITUATION IN SPAIN:

Most of the Spanish plantations are new (less than 20 years old). The total surface area is estimated at some 1000 hectares. Of these, some 300 hectares are located in Lleida. Other important plantations are located in Castile-La Mancha, Extremadura and Andalusia. The plantations have primarily been established on dry land (an estimated 700 hectares), although there are also plantations with deficit irrigation (an estimated 300 hectares).

The pistachio was introduced to Spain by the Romans and cultivated by the Arabs. In the modern era it has vanished from our fields. After the reintroduction of the crop in the 1980's, it has recently awakened considerable interest, particularly in zones of continental climate.

In the first Spanish plantations many mistakes were made, typical of the introduction of new crops. Plantings were carried out without the basic infrastructure required. . Several key elements were lacking: availability of shoots for planting of good quality, knowledge of the characteristics and adaptation of the vegetable matter to our conditions, problems of multiplication, etc. All of this led to certain disillusionment with this crop. However, these mistakes have been subject to ongoing correction, and as of now the technological level of the new plantations has improved a great deal. Spain's imports of pistachio are around 12000 tons a year. The main shipments come from Iran, Germany, Turkey and others. Pistachio is an alternative for cultivation in Spain because of its good adaptation to regions with continental climate and the growing demand for the nut.

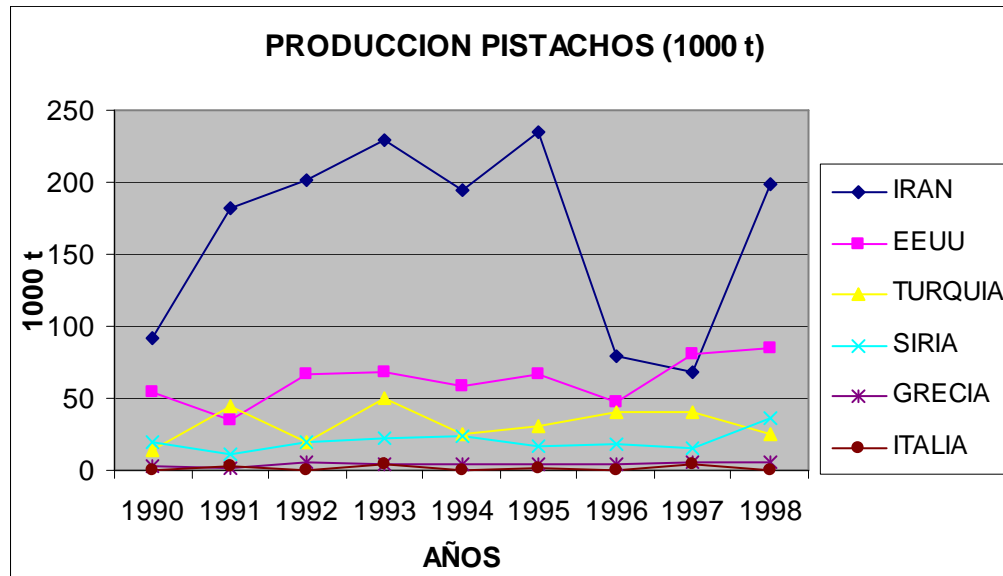
4. THE PISTACHIO TREE (CURRENT OVERVIEW)

WORLD SITUATION:

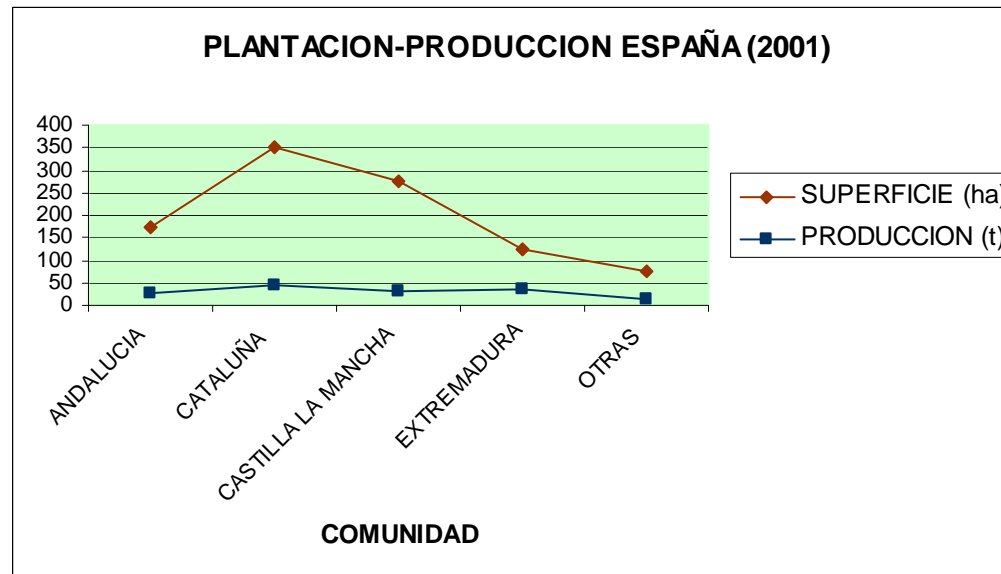
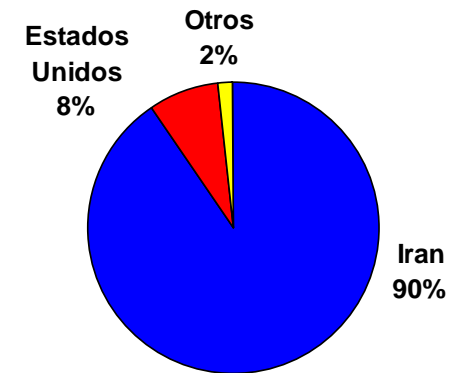
The cultivation of the pistachio tree is mainly located in the Middle East (Iran, Turkey, Syria), the Mediterranean (Greece, Tunisia, Sicily) and California. In California, its cultivation has undergone a significant expansion in recent decades. There are notable differences among the producing regions. Thus, for example, in Italy and Turkey, it is very common to find the pistachio tree growing in marginal conditions of soil and water, taking advantage of the tree's ruggedness. On the other hand, in California, Greece and Iran the plantations are located in irrigated land and the tree enjoys the same care as any fruit tree, thereby achieving high average yields.

World production is expected to increase in coming years, particularly due to the productive potential of the new plantations in Iran, Turkey and California. Nevertheless, demand also shows good prospects for increasing: opening of new markets, development of processed products, etc.

4. THE PISTACHIO TREE (CURRENT OVERVIEW)



IMPORTACIONES ESPAÑOLAS



4. THE PISTACHIO TREE (MODERN CULTIVATION – ADVANTAGES)



Pistachio tree with surface watering (6 years old)



4 year-old pistachio plantation. Underground watering (Toledo)

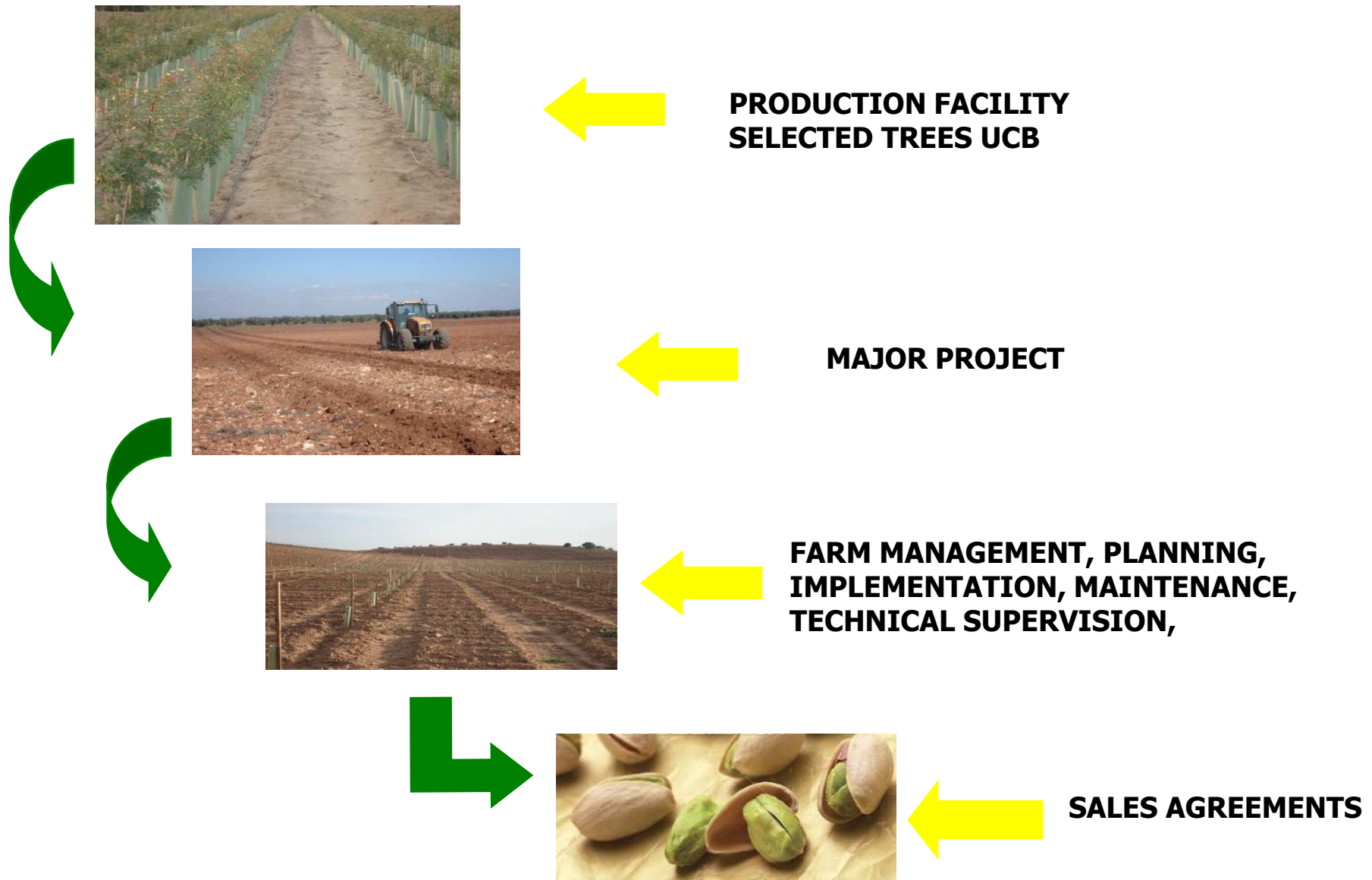


Javier Hormigos and Pedro Hormigos in charge of Valseco



Nursery of selected trees

5. THE VALUE CHAIN



5. THE VALUE CHAIN (FARMERS)

- The current agrarian model in Europe is coming to an end (subsidies, PAC reform, sustainability, etc.)
- Farmers must seek alternatives for cultivation
- The cultivation of pistachio is a profitable solution that is built solidly on a product with a big market in the European Community
- Traditional cultivation in the countries of origin such as Iran, together with economic instability and the high price of entry into Spain endow domestic cultivation with great economic and strategic appeal.
- The modern cultivation of pistachio makes it possible to achieve greater profitability than any other crop, (revenues – annual costs = 3500-4000 Euros), with a high degree of mechanization and professionalization of management obtaining optimal production of high quality with a good quality/price ratio.
- Entry into production begins starting with the fifth year of growth
- Investment is subject to subsidies for facilities and equipment (which varies among the different autonomous communities of Spain)



5. THE VALUE CHAIN (PROCESSING – SALE)

- Implementation of drying operation at the farm or integration with the drying operation of the group (this decision will depend on the surface area of the project, investment capacity, and other elements)
- Harvesting is conducted with equipment that is subcontracted or in which Valseco has a share
- The processing and packaging of the pistachio is carried out under strict protocols for handling
- Commercial agreements for participation in different phases of the operation
- Possibility of contracting of services for own brands, packaging, etc.



6. THE BUSINESS MODEL

- Investment plan
- Projection of earnings
- Results

ECONOMIC MODEL FOR PLANTING IN REGADIO.SUPUESTO 25 HECTARES PISTACHIO

DATA FROM THE FARM:

THE FARM
OWNER:
STUDY DATE:

STANDARD MODEL PHASE: TOTAL PROJECT
AUGUST 09

PROCESSING AREA:
No. TREE/HECTARE
No TOTAL TREES

5,00 HECTARES
250 250 30
280 FEMALE POLLINATORS

FRAMEWORK 6 X 6 DENSITY 36,00 m2

YEAR		PLANTATION	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7	YEAR 8	YEAR 9	ACUMULATIVE
INCOME:												
Expected production per tree		-	-	-	-	-	3	4	8	10	8	33
Production provided by Ha		-	-	-	-	-	750	1.000	2.000	2.500	2.000	8.250
Total farm production		-	-	-	-	-	3.750	5.000	10.000	12.500	10.000	41.250
Price expected:	€uros / Kg	2,40	2,40	2,40	2,40	2,40	2,40	2,40	2,40	2,40	2,40	2,40
Harvest Value:	€uros	-	-	-	-	-	9.000	12.000	24.000	30.000	24.000	99.000
INVESTMENT:												
Projects and studies:	105											
Study and design:	60											
Soil Study S.I.S.												
Standard soil survey	45											
Installation of irrigation:	1.700											
Air irrigation installation												
Surveys and water harvesting												
Pumping Equipment												
Filter Head												
Fertigation												
Electrical installation:												
Electric line and box C.B.T.												
Planting:	4.274											
Subsoiling full cross	150											
Organic amendment	120											
Land preparation. Refining	40											
Marking of the plantation	120											
Opening of furrows	120											
Plant without grafting	3.080											
Protector	84											
Tutor acacia wood 170 x 3 x 3	210											
Manual planting work	350											
Total investment per hectare	6.079											
Total investment to transform plot	30.395	30.395										
MAINTENANCE COSTS:												
Total Maintenance Costs plot	4.450	-	4.450	4.950	5.450	5.450	5.900	6.050	6.650	6.950	6.650	52.500
Maintenance costs have	890		890	990	1.090	1.090	1.180	1.210	1.330	1.390	1.330	2.080
Pesticides, fertilizers, herbicides and fert.	125		125	225	225	225	225	225	225	225	225	225
Maintaining irrigation facilities	60		60	60	60	60	60	60	60	60	60	60
Grafting, pruning and training reinjertos	250		250	250	250	250	250	250	250	250	250	250
Tillage	120		120	120	120	120	120	120	120	120	120	120
Clearing and pruning chipping	60		60	60	60	60	60	60	60	60	60	60
Energy consumption and irrigation fee	200		200	200	200	200	200	200	200	200	200	200
Direction and technical assistance	75		75	75	75	75	75	75	75	75	75	75
Nutritional Control	-		-	-	100	100	100	100	100	100	100	100
Harvester and harvesting costs	-		-	-	-	-	90	120	240	300	240	990
BALANCE:												
Income-maintenance costs		-	- 4.450	- 4.950	- 5.450	- 5.450	3.100	5.950	17.350	23.050	17.350	46.500
Income-maintenance-Investment Expenditures		- 30.395	- 4.450	- 4.950	- 5.450	- 5.450	3.100	5.950	17.350	23.050	17.350	16.105
Performance of the implementation (€ / Ha)		-6079	- 890	- 990	- 1.090	- 1.090	620	1.190	3.470	4.610	3.470	3.221

COMMENTS:

- * When it comes to harvest value, we talk about the net charge for the grower.
- * Results depend on the data on cultivation techniques, design, price of production factors annual rate of production and mechanization of operations.
- * The production scenario is possible only in plots not marginal by soil or climatic effects, applying new farming techniques and the proper provision of irrigation and fertigation.
- * We believe a life for these plantations 50 years.
- * We do not consider price of land, loss of income or capital gains

7. FORMULAS FOR EXPLOITATION

- Leasing of farm for a period of 20 years
- Joint exploitation, with the issue of shares based on capitalization of the project
- Contracting of Services, through contracting of planning, technical management, maintenance
- Capital investment in the business. Profitability of 18%.