

## National Seed Industry: Strengths, weakness and future challenges

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Chilean national agriculture faces strong international economic competition. Seed production is an attractive option for producers who are looking for higher incomes via incorporation of more sophisticated and specialized technologies. At present, seed production industry has developed through improvement of specific technologies, qualified labor, suitable producers and professionals, generation of an infrastructure and an adequate processing, thanks to the management capacity and a greater number of international contacts.

Greater number of international contacts that companies installed in Chile are having, have evidenced high international economic competition from other countries. Some of these countries have lower operation costs and acceptable quality, so efforts from now on are concentrating on productive efficiency, to reduce costs and therefore lower prices, improving capability to compete in international markets. Worldwide, Chile is an important horticultural crop and maize seed multiplier. Growth of this sector has been harnessed by the existence of experienced producers and professionals and, compared to some countries, qualified cheap labor. In addition to this, though time, Chile has developed a more adequate productive infrastructure and greater management capacity. These facts are competitive advantages for seed multiplication in this country. However, due to increasing economic competition with seed multiplier countries who have lower production costs it is essential to rise efficiency and lower down costs, in order to be able to offer lower prices.

Over the last few years, Chilean exportation have grown importantly, reaching US\$ 135 million FOB in 2001, compared to just US\$ 35 million in 1990, being most relevant maize, horticultural crops, flowers, sunflower, forage and beans. In spite of Chilean competitive advantages, most of the increasing of seed production depended on external facts.

Worldwide, United States is the biggest producer and consumer of maize seed, so whatever happens to this country will affect the international market of this product. For example, over the last few years, the opposition of European Community to transgenic crops, has introduced a problem to constant growth of this area. Simultaneously, an economic recession started in the United States, which determined a diminution in maize seed consumption and also affected prices. However, Chile is still an option for quality seed counter season multiplication, even though, competition with other countries of southern hemisphere is still growing.

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Demand for horticultural crop and flower seeds has a similar behavior to maize. For example, flower seed demand is conditioned to demand for flowers, and this one as well is conditioned to the income of consumer in developed countries, because this are the ones that buy most of the worldwide production of flowers. And also, when income improves, the demand for flowers grows even more. This is why when per capita income improves, in developed countries as well as developing countries, it is expected that demand for flowers also grows. Horticultural crops have a rising tendency, due to the increasing demand for natural well balanced foods, so horticultural crop seeds are expected to follow the same tendency.

When this industry is analyzed, in a national and international frame, three main components can be distinguished: production, commercialization and investigation and development. Each one has different roles and characteristics.

In production component four different categories can be distinguished:

- Agriculturists and producers that keep a portion of their production as seed for the next year (rice, wheat and others).
- Producers that multiply seed to sell in the future, without previous contract.
- Producers that multiply seed to sell them having previous contracts with companies dedicated to development or commercialization.
- Companies dedicated to commercialize or develop seeds that are multiplied in their own research centers.

Companies and producers dedicated to commercialize seeds can be found in commercialization component. These can be local distributors or multinational companies.

Finally, in the third component of seed industry, organizations oriented to investigation and development can be found. These dedicate to improve existing varieties, by selection or incorporating desired characteristics (USITC, 1995). These organizations are companies, universities and other public organizations, they are located mainly in developed countries.

It is important to say that high investments made in investigation and development areas, and the relevance to protect intellectual property of varieties make that this industry is very secret about statistical information of research, production and commerce of seeds worldwide, what makes it difficult to data and quantitative global analysis of this sector.

However, it is known that thanks to most of the biggest international companies installed in Chile, as well as many national companies that multiply seed for other international companies make it possible to be the sixth biggest seed producer in the world, with exportations over US\$ 130 millions by 2001. Even though this is just 5% of global market participation, it points out the potential that Chile has as an international supplier.

The increase of consumer's requirements, mainly due to higher incomes, and an increase on worldwide population, without increasing cultivated surface, focuses to obtainment of products with higher yield and quality, but without increasing costs implied in their production. Fusion between companies orientated to different productive areas was the way to face this tendency. Mainly

consumers demanded more attributes, with shorter commercial life; therefore there is a growing need of improving investigation and development areas, with all the cost that this represents. Offering new products, as soon as possible and obtain margins that allow surviving in this competitive international industry is only possible by greater market participation.

This high competitiveness scenario implies the presence of mega-companies, with influence over the entire world. In order to improve the development of this market it is important to achieve an active participation of all the protagonists in the commercial chain, from producer/multiplier to final distributor. In this context Chile appears as an important seed multiplier for transnational companies, this allows them to anticipate the launching of new products, test new varieties and produce seeds at lower costs, improving competitive elements of multinational companies.

Even though Chile appears as an important worldwide producer, competing countries of the southern hemisphere (Argentina, Australia, South Africa) as well as northern hemisphere (China, India, Thailand) are rapidly reaching international demands in what respects to seed quality, reliability and value. So, Chile must maintain its position, and even more increase its global market participation.

To produce new varieties demanded in the future world market is the biggest challenge, for example, transgenic seed production. Chile is already modifying its existing regulations in order to adapt them and allow importing transgenic seed for multiplication and re-exportation purposes, but internal commercialization is still not allowed because it is still not ruled. It is necessary that Chile adopts clear rules in what respects to domestic consumption of transgenic seed and human consumption of products derived from these type of crops. This implies adopting adequate production capacity, clear regulations and rules in relation to sanitary aspects, protection of endemic vegetation and strengthen protection to intellectual property of new varieties that get into our country, in order to maintain an international status of reliability.

In addition to this requirements for the production of new varieties, Chile must continue being worldwide, in the lead of quality production, in order to subsist in this niche. Offering homogeneous quality throughout time must be accompanied by incorporation of new available technology that allows offering the product at a competitive price.

Chilean seed industry has an available infrastructure suitable for staying inside international market. However it is a challenge to improve Chilean position in the international market. It must be a national effort that involves the whole industry, through organisms or associations like ANPROS. More efficiency and efficacy is needed in public organizations, this would allow the generation of adequate politics in what respects to actual market requirements, in order to maintain and improve perspectives of Chilean seed industry.

According to SAG, the surface occupied by national certified seed production was 5,152 hectares, being wheat the most relevant crop, representing over 40% of this surface. In this context, 19,951 hectares had international certification (OECD), being maize the most relevant crop, with over 60% of this area. It is important to point out that certified seed is the one that is commercialized nationally, and the one with OECD certification is for exportation purposes. OECD certification is usually used in cereal, industrial and legume crops. Horticultural crop seeds do not require certification.

The rest of the surface designated for seed production is made under contract between national and foreign companies. This contract has specific clauses about the property of parental seed given to the producer, and the property of the multiplied seed, and also some characteristics of the final product given to the contractor company. It is important to point out that 90% of the seed produced under contract in Chile is exported in bulk, and packed in destination place to be re-exported. The other 10% is packed in Chile, under certification and international standards that assures quality in final product format to other countries in South America.

According to the last national farming census (INE, 1997), there are 3,066 agricultural operations that are dedicated to seed production, with a total of 29,778 productive hectares. In Table 1 there is a detail of the most important seed production species that were produced in 1997, being maize the most important one, with 13,867 hectares, distributed among 694 producers, followed by forage seed producers with 4,750 hectares and horticultural crop seed producers with 3,332 hectares. Sunflower seed producers had 1,556 hectares among 114 producers, this numbers may have diminished considerably since then. Bean seeds represent 713 hectares and other 5,562 hectares belonging to 679 producers are distributed among cereals, flowers, horticultural and industrial crops.

The 1996/97 productive season showed a concentration of seed producers around the Central Zone of Chile, with 73% of the producers concentrated in this area. Lately, about 5% has moved to the Southern Center Zone.

In what respects to demand for labor, multiplication and traditional and hybrid seed productions generate a demand for labor mainly in activities like removal of ear of corn, elimination of out of type plants, male-female differed sowing, hybridizing, harvesting and others. Requirements for labor are determined by productive parameters of the multiplied specie. But due to the loss of competitiveness because of the rise in cost of labor have diminished the demand for labor. According to data of the 1997 census, which estimated that surface dedicated to seed production for export was 21,601 hectares, which demanded an equivalent labor of 5,000 permanent jobs.

During the last few years, modern technological packs have allowed acceding to a quality that is highlighted in the world of seed production. Due to the massive use of labor we are losing competitiveness, respect to countries that have much lower costs or much more efficiency than Chilean labor. In spite of this, the level of specialization in Chile has made possible projecting if these problems are solved.

When done a characterization of producers dedicated to seed production, it shows a great variability. Some have complete infrastructure to produce correctly, but require a lot of help from the contracting companies to obtain good results. Generally, with a good technical advise producers are able to produce good raw materials. When technical advise is insufficient or has failed, producers face serious problems handling weeds or adequate irrigation, affecting seriously yield and quality of produced seed. A minor percentage corresponds to business leader producers, who develop this activity as a business. These are producers that lead this industry that have access to the newest production technology. They have adequate management that allows them to constantly improve their productive level, travel to get to know other productive situations and are creative enough to solve problems that may show up during crop management. Chile has these two main groups of

producers, so initiatives for capacitating and specialized technical advisory in what respects to seed production may improve the quality of the producer into a reliable producer.

As mentioned before, Chilean seed industry exportations have grown at positive rates over the last 6 years (Figure, 1). But in 1998, because of the great increase in maize seed, the market as a whole, grew in volume and price (because maize represents over 40% of the seed market), the total amount exported by just this crop was over US\$ 85 million, and during the next years the market has rebalanced and adjusted its price, mainly led by North American market, growing at a rate similar to the one before 1998. As seen in Table 2, there is a step down in the total value exported in 2001, in relation to previous years. This is because of the considerable decrease in exportations of sunflower seed, and a minor decrease in horticultural crop seeds, because of world economic instability and negative reactions of some groups to technological changes, no doubt this will affect Chilean seed industry.

With this future, Chile will have to work hard on improving all its participating agents, public and private, of the whole production chain of Chilean seed industry, which will have to take charge of coordinate actions in order to reduce costs associated to primary production, by adoption of adequate technological packs for seed production, and strengthen relationship between provider and company, allowing improvement of Chile in global seed market.

Future challenges are positioning Chile in the global seed market; allowing it to figure as a relevant participant in seed industry, with recognition of its quality. It is relevant to take consideration of some technical and legal subjects that are fundamental to the development of companies in this industry. It is also fundamental to strengthen the Association of Seed Producers (ANPROS), organizing and consolidating ANPROS in national and international context, with an integrated and consensual strategy, that considers particularities of every sub-sector.

Companies should strengthen relationship between company and provider; supporting this relationship, as a way to adopt successfully the difficulties about adoption of new technologies and competition to the primary productive sector.

Finally, improve performance of seed companies; impel specific actions in technological, management, human resource, organization and infrastructural aspects, tending to improve performance of companies orientated to international market.

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Table 1. Chilean seed production; number of producers and acreage by crop, 1997.

Crop	Number of producers	Acreage (ha)	Average acreage by producer
Maize	694	13,867	20.0
Forage	306	4,750	15.5
Vegetables	1,143	3,332	2.9
Sunflower	114	1,556	13.6
Bean	130	713	5.5
Others	679	5,562	8.2
<b>Total</b>	<b>3.066</b>	<b>29,778</b>	<b>9.7</b>

Source: INE, 1997

Table 2. Chilean seeds exportations by crops, during 2000 and 2001.

Description	2000		2001	
	US\$	%	US\$	%
Maize seed	68.085.000	43	66.267.000	49
The rest of vegetables	35.471.000	23	29.470.000	22
Flowers	15.883.000	10	17.851.000	13
Sunflower	14.274.000	9	3.764.000	3
Melon and Watermelon	10.670.000	7	5.119.000	4
Tomato	6.325.000	4	5.045.000	4
Forage seeds	2.475.157	2	2.135.557	2
Common bean seed	2.275.000	1	3.224.000	2
Others	1.654.642	1	1.257.712	1
<b>TOTAL</b>	<b>157.112.799</b>	<b>100</b>	<b>134.133.269</b>	<b>100</b>

Source: ODEPA, 2002.

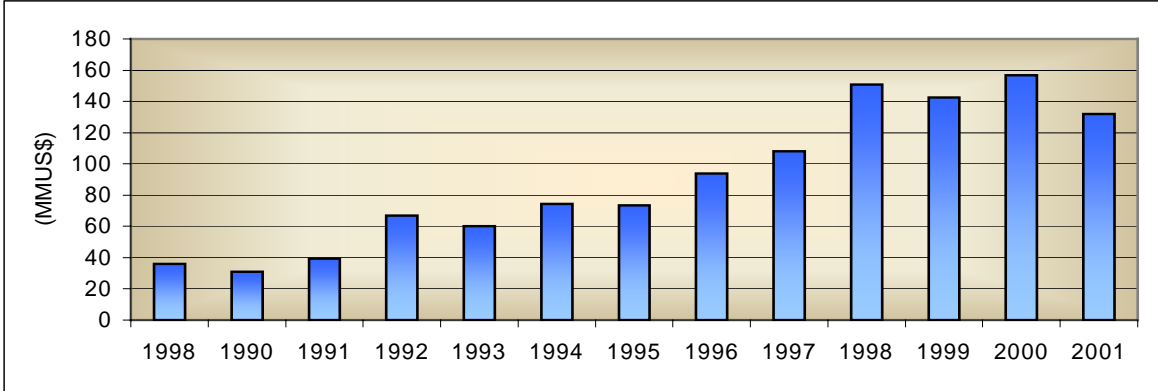


Figure 1. Evolution of Chilean seed exportations (elaborated with data from ANPROS).