



# Rice production in Europe

## - A report on a European Rice Study Tour & the International Temperate Rice Conference

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### in a nutshell

- An Australian delegation attending the pre-conference tour and the 4th International Temperate Rice Conference gained a comprehensive overview of the environment, production systems, processing systems and marketing of the rice produced in the areas visited
- The study tour provided a great deal of insight into the significant role of government in European rice production, and importantly, provided exceptional exposure to the latest advances in temperate rice research
- The delegation was able to establish and maintain international contacts, foster greater understanding of rice production and allow attendees to identify research gaps and foster new ideas for the Australian rice industry

***A conference and study tour through mediterranean Europe improved understanding and knowledge of rice culture in overseas countries, performance of overseas rice based systems both environmentally and economically, identification of areas of possible improvement in Australian production systems, and facilitated exposure of Australian rice research and development and practices to international peers.***

The European rice pre-conference study tour through Spain, France and Italy was conducted 16–24 June 2007, prior to the 4th International Temperate Rice Conference, held in Novara Italy, 25–28 June. Both events were attended by an Australian delegation of rice growers, researchers and industry members. The delegation experienced first hand current European and international research, extension and rice crop management practices. Furthermore, there were many Australian research presentations given at the conference by members of the delegation, which were well received by the international rice community.

### Learnings from the tour

The pre-conference tour visited rice mills, research stations/centres/institutes, rice co-operatives, rice breeding trial areas and growing areas, various local farms including organic and mixed systems across the rice growing regions of Spain, France and Italy.

The tour started at Valencia in Spain, visiting the Sueca rice area (Figure 1), followed the coast north to Tortosa where the Delta Del Ebro was visited before traveling to France and the Camargue rice area. The tour then progressed to Novara, Italy for the conference.

This article summarises the key issues experienced by the Australian delegation. It was found that European countries

had similar issues to the Australian rice industry such as increasing production costs and increasing environmental pressures, agronomic limitations such as weeds, pests and diseases, and increasing age of farmers and viability of small holdings. However, there were notable differences in their environmental management policies, and rice variety and trait breeding aims, and European rice growers did not suffer the same limitations due to water availability as found in Australia.

### Environmental management

The European system does not separate the rice cultivation areas from remnant and protected ecosystems, and manages them as a whole. For example, the Camargue Delta in France is a protected nature reserve in which rice producers play an integral part in its sustainability, by flushing salts and providing wildlife habitat when the fields are flooded.



Figure 1: IVID Rice Research Station at Sueca, near Valencia, Spain



Producers in this region are under strict restrictions in terms of fertiliser use, stubble burning and flooding times, however, they are rewarded for undertaking this type of production system.

Rice crops are also used as living filters for upstream industry in many areas and using rice rotations for draining salt out of the profile for other crops is well promoted.

However, the Australian rice industry is a leader in addressing its own issues of environmental sustainability, eg soil suitability, recharge management, irrigation layouts, precision agriculture, crop rotation, water productivity and programs such as the RGA Environmental Champions Program.

### European Union (EU) subsidies

Government agricultural policies in Europe appear to be more prescriptive, with restrictions covering winter flooding, pesticide and fertiliser use. However, at the same time European rice growers receive substantially higher financial benefits from government interventions than the Australian rice industry. The Common Agricultural Policy (CAP) of the European Union means that many aspects of government intervention in European rice industries are developed as requirements that must be met in order to receive CAP financial incentives. For example, whilst strict regulations over agriculture restrict insecticides for bloodworm, and nitrogen fertiliser, growers rely heavily on the assistance provided to remain economically viable.

One of the most notable differences of the European rice production systems, compared with Australian systems, was the production under the existing EU subsidies scheme and how it presents a surreal environment for research. For example, yield potential is no longer necessarily a target in breeding programs in these subsidised conditions. The subsidies are linked to environmental restrictions, eg winter flooding, pesticide and fertiliser use.

### Water productivity

Water productivity did not appear to be as much of an issue in Europe as it is in Australia. Volumetric extraction limits did exist, however they did not affect production. It was interesting to note that some Italian producers were facing an emerging water crisis with levels in the Po River being low due to drought (Figure 3).



**Figure 2: Flamingos feeding by the Etang du Vaccares, Camargue Delta - a protected nature reserve and rice growing area.**

The Australian rice industry leads its European counterparts in water use efficiency also, although water use in European rice production often has an extra degree of utility (habitat, salinity control) rather than just being for plant growth, as in Australia.

### Rice pests – weeds, insects & diseases

Weeds of rice crops in Europe are similar to Australian weeds apart from red rice. The prevalence of red or weedy rice was prominent in the European production systems visited. It affects 65% of rice fields in Europe and is controlled through the use of herbicides. Europe has more herbicides registered than in Australia. Therefore, it was felt by members of the delegation that potential new products need to be quickly identified and tested as per the Australian registration requirements to ensure that Australian rice producers are fully equipped to deal with weed invasions.

The rice stem borer *Chilo suppressalis* was causing significant yield reductions in Spain when not controlled with pheromone traps and dispensers. Farmers also had to contend with diseases including rice blast and stem rot.

The Australian rice industry has a clear production advantage over most other temperate rice industries given it does not have the weed, red rice. This illustrates that Australia's isolation and strict quarantine is one of the major assets in retaining a viable rice industry in terms of production costs and that all practical measures should be taken to prevent, for example, red rice reaching and establishing in Australia.

### Rice breeding

From the rice breeders who attended the conference there appeared to be a global trend to incorporating new streams of genetic resources into their programs utilising stocks from other international centres. The focus had shifted from conventional attributes commonly pursued by breeders such as yield and grain quality, and more on those which resulted in broad resistance to biotic and abiotic stresses. This shift in focus is likely because of the EU subsidy scheme reducing the priority for high yields. Many of the research facilities had dedicated sections to the detection of heavy metal accumulation in rice crops as many rice fields are used as filtering systems.



**Figure 3: A familiar sight to Australian rice growers - part of the Po River near Vercelli, which is at an unusually low level as a result of the current drought in Italy.**



Breeding Clearfield® (imidazolinone herbicide tolerant) rice varieties appeared to be one of the main aims of the breeding program at the Ente Nazionale Risi Institute in Italy, in an effort to give rice producers a better option for red rice control, and this trait was being bred into all rice variety types. As is evident in Figure 4, selection for the Clearfield allele appears to be a relatively simple procedure –progeny of the cross are treated with the herbicide, meaning that surviving plants must have the Clearfield trait.

In Sueca in Spain varieties were being bred to be adapted to rather low input (particularly pesticide) situations, for example broad resistance to rice blast was being targeted. Grain quality was also a major selection criteria in these programs, but not surprising traditional varieties like Bomba and Carnaroli have not been superseded.

### Organic rice production

Organic rice farms were also visited, however, surprisingly, the organic rice industry did not seem to form a significant part of any European rice industry. Problems with weeds, particularly red rice, and nitrogen fertilisation seemed to be the major deterrents. However the move to organics appeared to be strongest in the Camargue delta, with about 15% of producers having some organic certified area under rice cultivation, and about 5% of the total rice produced certified organic. To improve rice yields in the organic system the ORPESA (Organic rice production in environmentally sensitive areas) project was established to create an educational training programme to support farmers converting to organic rice production.

### Processing & marketing

Rice processing and marketing in the industries visited covered a range of models, ranging from all-encompassing local co-operatives, to private millers and farmers who sold their rice directly. Key differences with Australian processing and marketing included the promotion of traditional varieties marketed by variety name, and the emphasis on marketing the region of origin of the rice.

### Other issues

In spite of the differences between the European and Australian rice industries and the issues that affect them, there are some similarities, such as an aging population of rice farmers, increasing production costs and environmental



**Figure 4:** The surviving plants in this photograph are progeny of a cross with the Clearfield herbicide tolerance trait. They were selected with an application of the herbicide.

pressures and the limitations of flat layouts for crops following rice. At the same time, one of the big differences between Australian producers and their European counterparts is the much smaller farm size in Europe and the huge cost of land suitable for rice growing, which was exacerbated by increasing urbanisation.

### Australian research presented at the Conference

Several papers were presented at the conference from Australian researchers and all were well received. Topics covered the Australian experience and current research on crop diversity, rice variety development, the performance of raised beds, rice-field yield variability, alternative methods for rice seed establishment, rate and timing of nitrogen application in paddocks subjected to midseason dry down, and measuring rice grain dimensions using flat bed image analysers.

### Concluding remarks

The attendance of Australian rice representatives at the 4th International Temperate Rice Conference and the pre-conference tour around Spain, France and Italy was highly successful and clearly met the primary aim to better understand the European rice industry. The pre-conference tour as well as the conference provided a comprehensive overview of the environment and production systems of the areas visited, as well as the processing and marketing of the rice produced. The trip provided a great deal of insight into the significant role of government in European rice production, and importantly, provided exceptional exposure to the latest advances in temperate rice research.

The Australian delegation was able to establish and maintain international contacts, foster greater understanding of rice production and allow attendees to identify research gaps and foster new ideas for the Australian rice industry. The latest information available at the international level will be brought back to Australia by the delegates and be used to improve understanding, research and development and production systems of the general rice community. 🌾

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**Figure 5:** This new Spanish mill built in 2003, belongs to Europe's youngest rice cooperative.