Ricegrowers' Association South American Study Tour
and 3rd International Temperate Rice Conference, 2003

WATER QUALITY STUDY TOUR

Introduction

The major rice growing regions of North Eastern Argentina, South Brazil and Uruguay were visited in association with RIRDC between 2/3/03 - 9/3/03. Currently, drainage water quality from agriculture does not appear to be of high concern to these countries mainly owing to the total area having abundant water supplies through high annual precipitation, large groundwater reserves and major river systems. There have been sporadic studies of pesticide concentrations in rice drainage water and in receiving rivers but results from these have provided little reason for further investigations or long term monitoring programmes of drainage water quality.

Most concern over water quality in these countries arises from point source pollution from urbanisation. Both industry (heavy metals and hydrocarbons) and untreated human effluent continues to be a high polluter of supply water ion the form of rivers and lakes.

Argentina

The region of Entre Rios ('between 2 rivers') in north eastern Argentina has no overall shortage of water. It is located between the River Parana and the River Uruguay, the area receives approximately 1200 mm of annual rainfall and overlies large reserves of artesian groundwater of the Chaco-Parana Basin Aquifers. In Entre Rios, water for agriculture is typically accessed by boreholes and pumped approximately 60-70 m. In Corinthos, dams tend to be the most common water supply.

Prior to sowing the rice growing area is sprayed with glyphosate (Round Up). Rice is sown on to non-flooded soils and herbicides (no insecticides are used), typically applied by air, include clomazone, quinchlorac, aloxifop and imidazolinone herbicides for broad leaf weed control such as barnyard grass. Permanent flooding is applied 50 days after sowing. From a farmer and industry perspective there were few concerns regarding deterioration of water quality. Pesticide use mainly occurs prior to flood onto bare soil for systemic control and high rainfall facilitates dilution should escapes occur. However, there are no drainage water quality monitoring programmes in place to verify these assumptions and apparently little interest in further investigation.

In areas where rice was grown continuously for several consecutive years, salinity problems became evident particularly towards the central part of the state. However, after rotation with other crops problems were apparently alleviated presumably through leaching.

Brazil

Brazil grows approximately 3.5 million hectares of rice of which 1 million are grown in the region of Rio Grande Du Sol. Water is not scarce in this region with 1600 mm of annual precipitation. Up until recently there has been little need for regulation. The situation is becoming more serious and water is starting to become regulated through committees comprising representatives from different parts of the community (NGO's, irrigators, government). Because rice growing is the biggest user of water it is seen to be problematical among the general community which is influencing government. In reality, the reasons for concern relate to the location of water within the landscape and the infrastructure required to move it around rather than overall abundance. The current infrastructure (or lack of it) means that some farmers have more water than others, particularly in dry years, when stored water needs to be relied upon and this is causing increasing tensions between growers as well as the wider community pressures. The government is at the earliest stages of water reforms. Some individuals have water licenses but not all and there are regulations in place for landholders to seek approval for the construction of farm dams.

There is little information on water quality programmes. One sample every 3 months is taken from the River Uruguay and one sample/month is taken from Lake Iguaio but the data is not freely available. Concerns of water quality for agriculture in this region relate most heavily to the supply water from the river that has been heavily contaminated with heavy metals in the past by industry and by untreated human sewage. Local anecdotal views indicate that rice drainage water quality is higher than supply water quality although there is little or no scientific evidence to demonstrate these opinions. However, the problem is considered extreme enough for the Camil rice mill to only use groundwater and rainwater rather than river water in their rice milling operations.

Herbicides typically include quinchlorac, clomazone and propanil and, as in Argentina, there is little concern regarding drainage water quality based on results from a one off study conducted in the late 1990's. However, rice growers continue to face problems from conservation pressure groups that are opposed to the growing of rice. This opposition seems, in the Brazilian environment to be a knee jerk reaction due to rice being the largest consumer of water rather than concerns being underpinned by scientific measurement. There are no agricultural drainage water monitoring programmes in place. The farming lobby take the view that minimum tillage and flooding of rice 15-20 days after sowing minimises the movement of pesticides off-farm. In the case of field water losses through high rainfall events '....there isn't a lot that can be done' and it is considered that any incidences of pesticides in the river will be rapidly dissipated through dilution.

Uruguay

The heart of the Uruguayan rice industry is located in the Cuchilla Grande and on the Rio Olimar arounf the town of Trienta Y Tres. Approximately 185,000 ha of rice are grown with rice growing development increasing in the north of the country where warmer temperatures are tending to improve yields. Annual precipitation is usually between 900-1300 mm but over last 3 years it has been between 2000 - 3000 mm.

Water is supplied by pumping from the Olimar River (50%) and from dams (50%). The rice millers (Saman) owns much of the dam and channel infra-structure and water consumers get charged for the transfer costs of water rather than paying for the actual water per se.

For weed control, glyphosate is applied prior to ground preparation in about September. This is followed by quinchlorac (1.3 L/Ha), propanil (2.0 -3L/Ha), clomazone (0.8 L/Ha) and plurafac (non ionic surfactant) just prior to permanent flood 25-30 days after sowing.

There have been several studies of pesticide persistence but no withholding periods have been put in place and so far there is no clear evidence that there is a risk of pesticides polluting the environment.

Conclusions

Generally, the development of the rice industry seems to increase from Argentina to Brazil with good agricultural practice being most highly developed in Uruguay.

The three countries apparently had little cause for concern with regards to water quality owing to substantial high quality supplies. However, there was little effort to demonstrate this unequivocally through a structured system of scientific measurement. Unlike the Australian rice industry these countries did not recognise the value of risk assessment to demonstrate insignificant impacts on the environment which could be used to their advantage when fending off pressure from green groups which could threaten the sustainability of their industry. Their approach continued to be one of fire fighting and negotiation rather than leadership.