



## Rural Water Note

RWN 02

### Understanding Water Supply Reliability – September 2007

In dryland agricultural areas of Western Australia, seasonal rainfall fluctuations necessitate the design of reliable on-farm water supplies so that farming enterprises can continue in low rainfall years.

Reliability is a term used to express how often the user of a system is prepared to allow a water supply storage system to fail. The more reliable the system required, the greater the need for precision design and construction – and the more expensive it is to install and maintain.

Reliability is normally expressed as a percentage or as an expected failure frequency. For example, a system with a reliability of 50 per cent has a 50 per cent chance of success in any given year; and, of course, a 50 per cent chance of failure. This may be also expressed as a one-in-two failure rate (ie 1:2 years).

A system with 90 per cent reliability has a 90 per cent chance of success in any given year and the failure rate (10%) may be expressed as one-in-ten (ie 1:10 years). Note that it is possible for a system with a 90 per cent reliability rating to fail more than one year in succession (when we get two or three, one-in-ten year events in succession), but in the long run it will average out to one failure every 10 years.

The level of reliability required often depends on the impact that system failure will have on those affected and the cost associated with failure.

Some farmers may be prepared to accept a failure of a system once every five years – others only once every 20 years.

Consideration needs to be given to the type of agricultural enterprise, with the importance of

water resource reliability increasing as the degree of agricultural intensification rises. In an intensive farming system, such as cattle feedlots or piggeries, where water consumption is high and forward contracts or other business agreements exist, access to a secure reliable water supply is paramount.

Farm water supplies for broadacre enterprises are designed with a nominal reliability rating of at least 90 per cent. However, many on-farm water supplies are rated only as 50 to 70 per cent reliable, resulting in a heavy draw on the public scheme during relatively low average rainfall years.

Carting water generates high costs to the community to maintain the supply and a high cost to the farmer in both dollars and time. A 20 per cent improvement in reliability of on-farm water supplies will benefit the public and the farming community, releasing public funds to create and maintain community and emergency off-farm water supplies.

#### Further information

*Designing for Reliable Water Supplies.* Farmnote 72/2004. Department of Agriculture and Food, Western Australia.

Farmer, D. and Coles, N. May 2003. *Assessing Storage Reliability of Farm Dams.* Resource Management Technical Report 245, Department of Agriculture and Food, Western Australia.

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