

Below: Water quality benefits of the improved farming system.

| Practice | Water quality benefit |
|----------------------------|--|
| Trash blanket | Reduction in sediment losses through soil erosion Reduction in reliance of herbicides for weed management |
| Minimum and zonal tillage | Reduction in sediment losses through soil erosion |
| Controlled traffic farming | Reduction overall farm runoff and losses of inputs |
| Fallow cropping | Reduction in sediment losses through provision of cover during the fallow Potential reduction in herbicide use through better weed management |

Improve water quality with the improved farming system

Sugarcane farmers using an improved farming system are not only seeing benefits to their production, but also improved water quality outcomes. By Belinda Billing, Adoption Officer, Brandon

For many years sugarcane agronomists have been promoting what is commonly known as the Improved Farming System. This is the management system developed through the Sugarcane Yield Decline Joint Venture (SYDJV); a 14 year research program led by Dr Alan Garside and conducted by a range of research agencies. The project began in 1993 and ran until 2009, combining research and extension as the work progressed.

The research identified a number of practices that could be adopted as a full system to improve all aspects of soil health and address the problem of yield decline. Sugarcane growers who have adopted this system are seeing long-term benefits with increased numbers of ratoons, maintenance of higher yields across ratoons, and dollar savings.

Another less well-known benefit of the Improved Farming System is the overall reduction in rainfall run-off leaving the farm and improvement to water quality when compared to conventional farming. The reduction in rainfall runoff is a result of the increase in soil water holding capacity achieved through reduced compaction with controlled traffic farming. A four year water quality

study conducted in Victoria Plains by the Department of Natural Resources and Mines found an average reduction in runoff of 17 percent on a 1.8m controlled traffic system, compared to 1.5m system.

This reflected an earlier rainfall simulation study on a 2m dual row controlled traffic system in North Eton which found significantly reduced runoff at both one and 21 days with a simulation of a one-in-10 year rainfall event (100mm/hr). The trial was able to record and sample natural rainfall which showed a similar reduction in runoff.

Both trials also showed a longer period for the Improved Farming System to begin running off and lower rates of peak runoff. This means that soil managed under this system has much greater infiltration.

A reduction in overall run-off benefits both the grower and the environment. The grower benefits from increased water holding capacity in their soils. This means, in dryland crops, that more rainfall from every event is held in the soil and made available to the plant. In a fully irrigated system the grower gets more value out of the irrigation water applied.

High levels of runoff can also result in increased losses of applied nutrients and herbicides through poor incorporation and the early onset period to runoff.

Another recommendation of the Improved Farming System is to maintain soil cover through a trash blanket and fallow cropping. The trash blanket conserves soil by preventing erosion through rainfall runoff. It also provides protection against weeds, reducing the amount of herbicide that needs to be applied. The four year water quality study at Victoria Plains showed a dramatic difference between sediment lost in runoff from the bare plant cane and ratoons that were protected by the trash blanket. This was also a reflection of cultivation, with no tillage conducted in any ratoons.

A further reduction in lost sediment can be achieved by maintaining cover throughout the fallow period. The improved farming system recommends fallow cropping to achieve this, which provides a break from the monoculture of sugarcane. All of these practices are recommended in the Smartcane BMP, which aims to improve farm sustainability, profitability and productivity.