

Harvesting water as a second crop

By Sanjay Shukla

Too little or too much water captures the range of south Florida's water woes. The region faces daunting water-quantity and -quality challenges. Demand for water, mainly caused by urban growth, is expected to increase by 25 percent by 2020.

Agricultural stormwater harvesting has the potential to provide an alternative source of water. Given high land prices spurred by urban development and relatively low profit margins for agriculture, harvesting and trading or selling water captured in agricultural areas could provide not only an alternative source of water but also help increase the profitability of farms and keep the land in agriculture.

There are four important factors for water harvesting from agricultural areas: collection, storage, treatment and conveyance. Water is at its peak during the wet period (June through October), when much of the annual rainfall is received. Because many citrus, vegetable, and sugarcane operations have stormwater impoundments (or reservoirs or ponds), these structures are a natural choice for collection and storage. Water is drained from the cropped areas and pumped into an impoundment, from where it eventually flows to a larger water body (e.g., a river). For vegetable farms, water either is pumped into an impoundment or is allowed to flood the fallow fields during the wet period.

A recent University of Florida Institute of Food and Agricultural Sciences study, available at <http://edis.ifas.ufl.edu/AE398>, found that with some modifications, water from citrus impoundments can be an alternative water supply during the dry season (November through May) and provide up to 120 acre-feet of water (from a 109-acre impoundment).

Because these impoundments already exist, no additional land needs to be purchased. The water collected can be stored either there or through other means, such as injection into deep wells using Aquifer Storage and Recovery tech-

nology. In cases where there are several large impoundments in the vicinity, they could be tied together as part of a distributed reservoir system within a basin to justify storage using the ASR technology.

Depending on the intended use, water harvested from agricultural areas could be used on site or conveyed for use at other locations. The conveyance of the harvested water depends on the location of the user. If the water is to be used on site, the conveyance cost will be lower than if delivering it to areas miles away.

Opportunities for additional income for the landowner will vary from farm to farm and for different crops. One option for citrus and vegetable growers with impoundments is to store water for irrigation use on the farm during the dry season. If growers are allowed to trade an equivalent volume of water with alternative users (e.g., water utilities), it could provide supplemental income. The amount of water traded could be made available to utilities either in the form of additional groundwater or surface water. If a farmer doesn't have an existing impoundment but is willing to allocate part of his land for certain periods or the entire year to store water, the water harvested could be traded.

Harvesting agricultural water for reuse also has potential environmental benefits, as it recycles nutrients and reduces flow from the agricultural lands. While designing such a system, efforts should be made to ensure that it meets the flow levels set for downstream water bodies



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These two photos are examples of typical agricultural impoundments in Southwest Florida. There is the potential for impoundments to allow agricultural operations to harvest and trade water, thus becoming a secondary source for income. Impoundments also offer environmental benefits.

and will protect the environment.

Harvesting water from agricultural operations seems to be an attractive option. The deciding factor will be the cost. A cost-benefit analysis is necessary before fully realizing the potential. Considering that somewhat expensive options such as desalinization are being considered and implemented, water harvesting may be an equally viable, if not better, option. *CVM*

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