Reducing Surface Water Loss

I planted too much summer squash in an area that I had underlain with a membrane to trap irrigation water. It appeared quite delicate in that it promptly began to wilt if a couple days went by without a fresh splash of water. So I finally quit watering about half of these plants (the half on the right in the photo below), and was expecting instant compost in the neglected section.

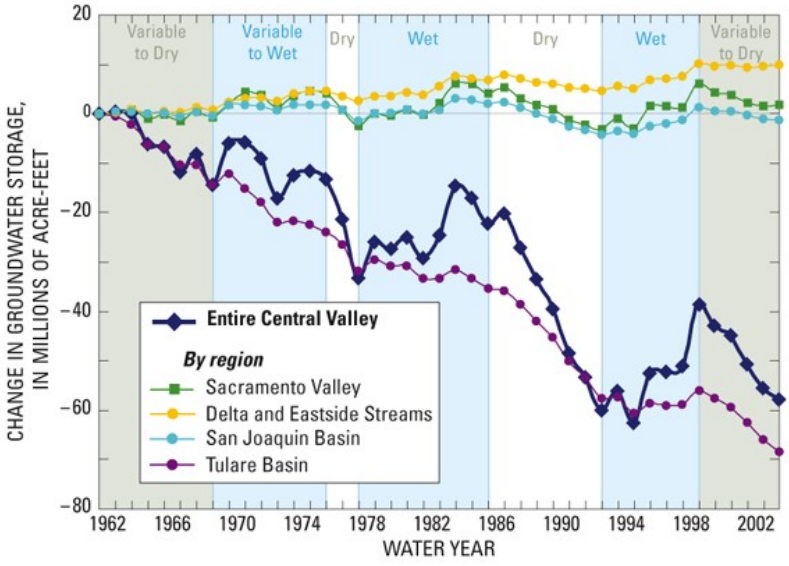
However; those plants refused to die. They turned ugly enough – yellowish and perpetually wilted, but they continued to produce small amounts of fruit. This serendipitous feat took place during days of triple-digit weather! The difference is obvious in the photo.

The fact that they survived and produced at all with no direct water under those conditions demonstrates a clear case for water savings based upon an artificial water table alone.

Ladies and gentlemen, we have a problem

The availability of water in California's Central Valley is declining at an alarming rate. Plots of formerly productive farm land are now being sold just for the rights of the water beneath them – with the expectation that those plots will never again be farmed (since they no longer have access to water).

No amount of governmental hand-waving or mandates will ever be able to restore these water reserves. Beyond this, the aquifers where water was once stored near the surface have begun to collapse – lowering the actual ground level by 30' and more in some areas. Nature will never be able to recover these aquifers.



The best we can do is attempt to capture and store every available raindrop and snowflake our increasingly fickle weather system provides. Conceivably, a system of subterranean membranes could be deployed. But even if we could truck in a reduced water supply, the monumental loss of water by surface evaporation would still be in play.

An additional water saving technique is being explored

Where do weeds thrive? Seriously, if you were looking for small green unwatered plants in the landscape about town in late summer, where might you find them? How about adjacent to sidewalks and driveways, and even in cracks in seldom used pavement?

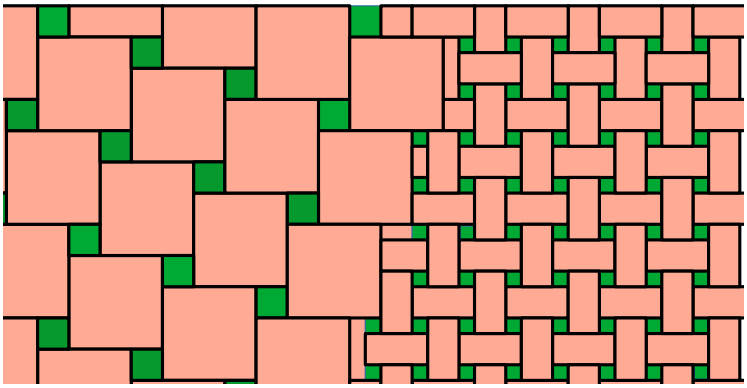
So cover your membrane-enhanced garden with 12” cement pavers that are offset to allow holes exposing only about ten percent of the surface of the ground to show through. For plants that require less spacing, develop a pattern from 4” by 8” pavers – although you would need to leave some of the spaces unplanted to allow access. Plant your things in these holes and you save about ninety percent of the surface evaporation.

I haven’t tested this, but I suspect that the combination of a membrane below and pavers above would make it possible to grow modest gardens on unimproved property with the amount of water you could carry in containers in the trunk of your car!

Incidental to all this, your weeding efforts are reduced by about ninety percent as well. For a gardener with suitable balance, you might forgo paths into this garden as you pick your way among the pavers.

The pavers could be temporarily removed if compost etc. needed to be added to the garden. Furthermore, the water could be flushed and changed through the riser connected to the drain pipe at the bottom of your membrane – should such amending become necessary.

Although we have abundant evidence from sidewalk-hugging weeds that such coverings systems would work, I am in the process or explorint this technique of water savings.



These water saving techniques represent a radical departure from current gardening practices. The labor intensity and material costs would make it far too expensive for commercial farming at the square mile scale – at least for now.

An initial trial involving freshly sprouted seedlings was a total failure (during 100 degree weather). So I’ve tried i again using bedding plants with well developed root balls and stem systems. The results are currently pending.

Meanwhile, it occurred to me that perhaps the reddish pavers are getting hotter than naturally gray concrete in sidewalks and driveways. So during the middle of a 101 degree day, I measured a few temperatures on a couple of full-sun sections. In one area the average red paver temperature was 133, whereas the nearby concrete driveway temperature averaged 125 – eight degrees cooler. When I compared gray sidewalk temperatures with adjacent decorative red pavers, the pavers were 142, with the sidewalk being 124 – 18 degrees cooler.

The obvious lesson is all this is to use the gray pavers instead of red ones – but wait: By that point I hadn’t successfully grown anything between the pavers yet, so I was unsure if it would work at all.

Realistically, agriculture as we have known it in the Central Valley is terminal. But those who continue to compete in this game receive ever-increasing prices for what they do produce. Never mind the fact that food shortages will continue to spiral.

In my opinion, it is time for a bold exploration into redesigning the food provision infrastructure. Any truly productive thinking will not merely address the obvious impending disaster, but will design a path that can adapt to foreseeable future challenges. For this, we may need an entirely new team of players.

People who are growing enough food to meet their own needs and yet have food to donate to agencies that give food to others, will at some point be able to barter food for the labor to develop gardens on other properties, when access to food becomes a problem.

A month later

I did a paver experiment near the first of September. I planted a few bedding plants and a single tender butternut squash seedling that is hardly noticeable in the lower center of this photo.

Hot dry weather and red pavers notwithstanding, the size of the lone squash plant exploded during the following weeks. Eventually I harvested at least one full-sized squash and a mature smaller one. I'm not expecting more, but I was amazed at what I got so late in the season.

The challenge now is to take these lessons and compile them into a flexible design that could be easily and reliably replicated. Besides repeatability, we should also consider potential expandibility to commercial scales. This phase is addressed in 03040-trench format garden.