

**Country Real Estate, #365: April 17, 2015**

## **Furrows trap water**

**By Curtis Seltzer**

**BLUE GRASS, Va.**—I spent this sunny weekend driving my tractor across 70 acres of hillside pasture at a breath-stifling two miles per hour. I had a goal but not a destination.

After hooking up a new subsoiler at the back of my antique (not old) Ford tractor – I’m using “hooking up” in that phrase’s original meaning -- I slowly dragged its chisel end through the sod to a depth of about eight inches in parallel lines spaced 10 yards apart.

A simple, one-shank subsoiler looks like this:



It was important that I carved these lines horizontally across the slopes, following the contours.

The deeper you’re trying to dig, the rockier the soil and the denser the dirt--the sturdier the subsoiler needs to be and the more pulling horsepower your tractor needs. Sod is dense, as are rocks.

Commercial subsoilers are too flimsy for much of the work for which they are intended. For that reason, I asked local genius welder, Steve Good, to brace, stiffen, reinforce and heavy it up.

The chisel at the bottom of the subsoiler’s shank breaks up compacted dirt as it cuts through. I was not particularly concerned about compacted dirt in my pastures.

But I'm very concerned about water.

About 37 percent of the contiguous United States experienced at least a moderate drought this week.

The most severe and chronic dryness is found in California, the southern Plains and to a lesser degree, the Southeast. Drought also affects spots in the upper Midwest, Northeast, Appalachia and even Virginia's Snowy Mountain. Drought appears to be intensifying in the hardest-hit regions and spreading.

Growth of my cattle pasture forage depends on several factors, including temperature, sunshine, dirt quality, grazing practices and water. Drought means low water, low forage growth, low food for livestock and low income from the farm.

Like much of the East, Blue Grass has been getting about 40 inches of precipitation annually. Of that, about four inches runs off, about 16 inches evaporates, as much as nine inches might be taken up by undesirable pasture plants, about two inches percolates deep, not quite seven inches goes to inefficient harvest and just a little over two inches ends up in desirable plants eaten by cattle.

I want to double those last two inches, or, in the case of drought, at least preserve them.

To offset drought and boost pasture productivity, I spent this weekend ripping shallow furrows in the sod.

The theory is simple. Cut shallow channels horizontally *across* the slope of the hills and perpendicular to the water flows. This will capture rain and run off and direct it into the ground. Better here, I say, than running off to the Chesapeake Bay for boating parties and whatnot.

Research suggests that these furrows should also reduce soil erosion, shatter compacted ground, aerate the pasture a little, encourage more grass growth and contribute to world peace.

The main point is, of course, to retain as much water as possible, locally. I'm not thinking globally.

If this works, the April-to-October steers will gain more weight, because they will have more nutritious food to eat. I'm hopeful that they will have growing grass in August when, typically, we are between rains.

Subsoiling is not moldboard plowing, which cuts deeper and turns dirt upside down and over.

Subsoiling slices a two-inch-wide trench that creates more pore space in the ground. This allows more water to be absorbed downward and minerals to move upward. Grass roots around the groove should be able to reach deeper, which will move nutrients and water up. The forage should be healthier and more plentiful, because it's making use of more resources.

With healthier root systems, pasture plants should be able to store more carbohydrates, which promotes regrowth after grazing. The quality of the pasture should improve as soil fertility increases. This is a rare case where good grass drives out bad weeds.

What began as a tactic to increase water absorption is, in effect, a strategy to build fertility and thicken the top layer of soil. This, hopefully, will increase pasture forage particularly during dry spells, which will increase pounds of gain, which will put more money in our pocket.

Some practitioners recommend cutting subsoiler lines two or three feet apart. I started with a much wider spacing...to see what happens...in for a dime, in for a dime. I might do another round in early July, because the grooves tend to close up over time.

The practical problem in improving hillside pasture is that it's dangerous to run a tractor crosswise over a slope.

Every year, about 130 farmers are killed in tractor rollover accidents, according to the National Institute of Occupational Safety and Health. Tractors are the leading cause of death on the farm. *Experienced* tractor drivers are involved in about 80 percent of all tractor rollovers.

About one half of the 4.8 million tractors in use do not have roll-over protection systems (ROPS)—steel cages or roll bars that protect a driver who is wearing a seat belt by keeping him or her in a protected zone.

During the last 30 years in my own county of fewer than 3,000, I've known two tractor fatalities and three badly mangled limbs that were caught in tractor machinery.

For this reason, I dragged the subsoiler cautiously across my slopes. Call me Chicken Seltzer.

The generally accepted rule of thumb on tractors is that if you start to pucker, you're traversing too steep a slope. I've been in two puckers, neither of which were to my liking.

I now avoid them. But if I got in another, I would steer downhill, not up, which is where my bad first instincts might direct me.

In addition to ROPS and a seatbelt, a farmer can increase tractor stability by setting the rear tires wide and filling them with a calcium chloride mixture to increase weight.

Of course the best way to manage rollover risk is to not get in pucker situations where rollover is a risk. Prudence says to let the dogs of the steepest slopes lie with their brows unfurrowed.

I've noticed over the years that new farming practices are almost always pitched by first-on-the-beachhead missionaries blazing with the zealotry of a revival.

Shallow furrowing, which is also called "Keyline cultivating," is one such example. (For a detailed presentation, see <http://permaculturenews.org/2013/02/22/before-permaculture-keyline-planning-and-cultivation/>.) Critics and skeptics have also weighed in.

The logic seems sensible to me, but I can't know whether it will work here until I give it a shot.

I'm not spacing my furrows as closely as the Keyline system proposes—by a lot. I want feedback, before I jump in with both feet.

In one small pasture, I cut in just three lines across the middle of the slope to see whether any noticeable difference would show up above, within or below them.

If subsoiling produces no measurable difference, I'm considering moving to Silicon Valley where failure is more richly rewarded than here in the Blue Grass Valley.

I'm now about \$500 into equipment and fuel at this point, not counting labor time, which a farmer never counts so as not to slip into a deep funk and take up gainful employment as a Walmart greeter.

(In case the farm fails, I've been practicing my "Heys" and "How are yous." I'm sure I would rank as high as the 50<sup>th</sup> percentile among greeter applicants, given my natural bubblieness and legendary ease around strangers trying to ignore me.)

If shallow furrowing works in my pasture, I should get close to the \$500 in extra gain on the cattle this season.

Breakeven on a small mountain farm is considered a win-win.