



Ross says he's literally changing his soil profile with this tool built out of a DMI ripper with a pair of 4-ft. long shanks fitted with "spader" blades.

"SPADER" REACHES DOWN OVER 2 FT. TO CREATE NEW SOIL PROFILE

Home-Built Tool Mixes Hardpan With Topsoil

By C.F. Marley

Ross Lay, Litchfield, Ill., thinks hardpan has gotten a bad rap. Instead of cussing it out, we should love it to death.

Even though compacted clay hardpan soil is regarded as a serious problem by most farmers, nobody has ever found a way to do much about it. Until now, that is.

What Ross is doing is literally changing his soil profile by reaching down to the compacted layer of clay soil 2 to 3 ft. below the surface and bringing it up to mix with lighter silty soils above. The payoff has been in bigger yields - an average of 25 bu. per acre in corn and 7 bu. in beans, according to local county extension director Ike Leeper who has been monitoring the results over the past few years.

Ross originally got the idea when he observed that crops were consistently better over an oil pipeline running through his farm. The only explanation he could come up with was that in digging the line, clay soil from below had been mixed with the silt above. In comparing his soil profile to the best northern corn belt soils, he discovered that his topsoil had only half as much clay while his subsoil had a much higher percentage.

To test his theory, Ross first bought a big Kellogg single moldboard plow made in Canada that's capable of plowing 3 ft. deep. He plowed over 500 acres with it, working 28 in. deep, but it took tremendous horsepower working at very slow speeds.

So he decided to build his own equipment, designing what he calls a "spader" out of a DMI ripper with a pair of 4-ft. long shanks fitted with "spades" made out of road grader blades mounted endwise and angled downward.

He works the spader about 2 ft. down, peeling out ribbons of clay from the hardpan. As it comes up the clay mixes with the silt topsoil. "The 2-ft. depth is about as deep as I can go with my 300 hp. tractor," says Ross. "I wish it was deeper."

Working with extension director Leeper and the Soil Conservation Service, Ross has determined that clay in his natural soil is 16% by weight. After running through with his spader, clay content increases to 24 percent. The reworked soil also has improved "cation" exchange capacity (CEC), increasing the availability of chemical fertilizers to the crops. This improved CEC



Spader blades are made out of road grader blades mounted endwise and angled downward.

(from 13.2 to 23.7 in the spaded soil) is probably the main factor in his yield increases. Decreased compaction and increased water mobility are other factors.

"Taking clay from that depth really relieves the compaction. Other forms of ripping might lift it some or compress it to the side, but what I'm doing permanently relieves it and allows some of the silt from the top to find its way down there," says Ross.

In 1990 county SCS officers marked off test plots in a soybean field and a local service company provided a weigh wagon to get a firm measure on the results. Yields from deep-plowed strips averaged 32.32 bu. per acre versus 24.26 bu. per acre in the unplowed strips.

"In 1988 the same kinds of measurements were taken with a 27.5 versus 20.5 bu. difference. Again about 7 bu. difference," says Ike Leeper. "In 1987, my first year monitoring the field, the deep plowed strips yielded an average of 128.5 bu. compared to 88.32 bu. of corn per acre. The corn yield in 1989 was 129.8 versus 97.6 bu. per acre.

"When you apply the same fertility, cultural practices, management and basically everything else, and the yield range shows as it has for four years in succession, does that tell you something about the profitability of the practice?" asks Leeper.

Ross is convinced the change in soil profile is a permanent one. Some of the soil he first plowed is getting darker in color, which he attributes to increasing organic matter.

Contact: FARM SHOW Followup, Ross Lay, Box 324, Litchfield, Ill. 62056 (ph 217 532-3890).



Applicator can be used in the fall after crop is taken off or in spring before and/or after planting.

TAILOR-MADE TO FIT NEEDS, BUDGET

Custom-Built Rigs For Fertilizing Row Crops

"We can tailor applicators to fit each farmer's needs and budget," says Larry Nelson, owner of L & D Ag Service, custom-builder of specialized fertilizer and spraying equipment. Pictured is the "Stripper" which the Hartland, Minn., firm custom-built for Minnesota farmer Archie Klunder, of Walters.

The basic frame is a 20 ft. wide toolbar salvaged from a Cyclo corn planter. Dry fertilizer is carried in a Gandy "Orbit Air" applicator and DMI coulters apply both dry fertilizer and anhydrous ammonia from a tow-behind nurse tank. The Stripper gets its name from the way it places fertilizer - in a concentrated strip that can be positioned in the center of a ridge, 6 to 8 in. to the side, or between pre-and post-planting.

The rig can be used in the fall to apply fertilizer after the crop is taken off, and in the spring before and/or after planting. It can handle ridge-till, no-till or conventional row crops; deep or shallow placement; and simultaneous application of dry, liquid or anhydrous fertilizer. Other available options include anhydrous metering, electronic scales, markers, knife sealers, pneumatic metering and delivery of dry or suspension materials, and various coulters, knife, pump and plumbing combinations.

For more information, contact: FARM SHOW Followup, L & D Ag service, Box 208, Hartland, Minn. 56042 (ph 507 845-2100).



Tine can be placed in this "tip up" position simply by pulling two pins on new bracket.

"Tip-Up" Bracket For Cultivator Tines

"We got the idea from farmers who complained about the time it takes to manually raise tines up out of the way with wrenches," says Roger Barenthsen, engineer with Alloway Rau, manufacturer of new "tip-up" brackets for S-tines that use locking pins instead of nuts and bolts to hold tines in place.

Barenthsen explains that most farmers put the new tip-up brackets on tines next to the row. When the crop is small, all tines are placed in the down position so you can cultivate up next to the row. As the crop matures, you shift tines into the second position which lets you raise or lower them by pulling just one pin. That lets you quickly raise the tines in parts of the field where the

crop has matured enough to make it difficult to cultivate next to the row, and then lower them back down again where the crop is still small - or where you've replanted - and you need to cultivate up next to the row. For late season work, you put the shank in the "up" position, using both locking pins, and just cultivate with the shanks between the rows.

The brackets fit any 2 by 2-in. toolbar. They're held in place with two set screws, which Barenthsen points out also makes it easy to change row spacings.

Brackets sell for \$22 apiece. For more information, contact: FARM SHOW Followup, Alloway Rau, P.O. Box 2825, Fargo, N. Dak. 58102 (ph 701 282-7014).