

IRRIGATES, FERTILIZES AND PUMPS OXYGEN TO CROP

Below-Ground 2-Pipe Irrigation System

A first-of-its-kind 2-pipe, sub-surface irrigation system outperforms underground systems that use only drainage tile, according to an Iowa inventor.

Ken Thornton, a drainage tile contractor in Polk City, says using drainage tile alone to irrigate is inefficient and may even cause damage to fields and crops. He recently installed his first 2-pipe underground irrigation system at the Iowa State Research Farm near Ankeny.

The idea is to pump water, nitrogen, fertilizers, herbicides and even oxygen to the crop through a 3-in. dia. perforated pipe, buried about 22 in. below the surface, and carry away the run-off through drainage tile buried 4 ft. or more below the surface.

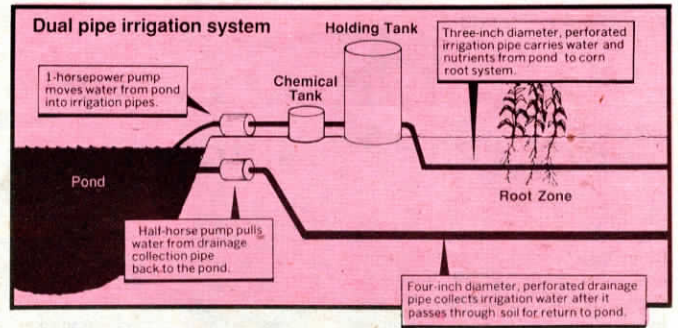
"It lets us pump water and nutrients to the crop at any time. If your corn needs water and nitrogen in the middle of July, you simply feed it in through the system," says Thornton.

Other new sub-surface irrigation systems pump water into the crop by

forcing water back up the drainage tile, in effect flooding the field from underground. Thornton doesn't like the idea.

"You have to raise the entire water table to get water to the crop from deep tile and the constant ebb and flow of water can cause silt to build up in tile. Also, when you flood the field you tend to eliminate oxygen from the ground which plants need to grow. In addition, if you get heavy rains it can take as long as 12 days to change from irrigation back to drainage if the ground is already flooded," says Thornton.

If your fields are already tilled, you can install Thornton's system by installing the feeder-pipe above it at about 90% of the spacing of the drainage tile. When buried at about 22 in. — depending on soil type — Thornton says it'll spread out over a 100-ft. area or more, working it's way out horizontally from the pipe. Water and nutrients that are not needed drain out the tile and are carried back to a central location. Because the pipe



is buried just 22 in. deep, the system requires a switch to no-till, eliminating deep-till equipment.

"We're actually able to increase soil tilth with this system by pumping compressed air into the ground through the pipe when we're not pumping water and nutrients. The oxygen stimulates bacteria which break down organic matter in the soil faster," says Thornton.

He notes that the system may cost as much as \$1,000 per acre to install from scratch. But, if you already have drainage tile installed, the cost would be around \$350 to \$400. "It must be engineered to your soil structure and type. Depth of the irrigation pipe is critical, and can vary from 13 in. to 3 ft."

The system installed at Iowa State pulls water from a pond with a 1 hp. motor, adding chemicals on the go. Water that drains down to the drainage tile is pulled out with a 3/4-hp pump and then filtered before being dumped back into the supply pond.

Thornton is working with Robert Horton, associate professor of agronomy at Iowa State and researchers from Pioneer Hi-Bred International, Inc., who provided seed corn on the experimental plot.

For more information, contact: FARM SHOW Followup, Ken Thornton, Water Management Technologies, 215 E. Grimes St., Polk City, Iowa 50226 (ph 515 984-6678).

HOLDS WATER SO IT DOESN'T DRAIN AWAY UNUSED

Water Control Valve For Drainage Tile

Sub-surface irrigation in drainage tiles is a lot easier with a new auto-control valve developed in Iowa.

Bill Schafer, of Agri-Drain Corp., told FARM SHOW that the valve works well with either sub-surface irrigation or simply as a way to hold water in underground tile to keep it from draining away unused.

The valve installs in the line, adapting to tile ranging in size from 6 to 15 in. in dia. One valve is installed in the main line for every

1 1/2 ft. of drop in grade through the field. That means that if the tile line drops 1 ft. for every 100 ft. of length, you'd install a valve every 150 ft., creating a kind of stair-step effect to hold water. Whenever desired, the flapper valve can be released, allowing water to flow out.

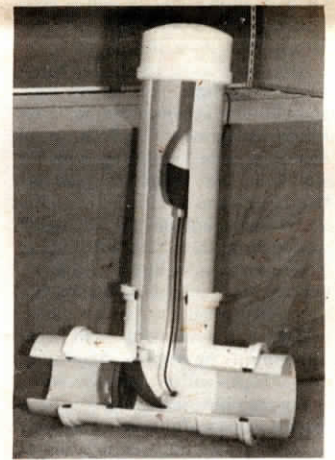
"Some farmers let all the water drain out until about July to dry fields and promote good root growth and then close the flap valves to store moisture for use during critical

growing periods after that," says Schafer.

The 6 and 8-in. dia. versions of the new tile valve sell for \$207.14 and \$285.71, respectively.

For more information, contact: FARM SHOW Followup, Agri-Drain Corp., P.O. Box 458, Adair, Iowa 50002 (ph 515 742-3347).

Tile valve stops water flow when preset level is reached.



DESIGNED TO FIT MODELS FROM 1967-77

Power Steer Kits For 4-WD Ford Pickups

"This integral power steering kit solves all steering problems with Ford 4-WD pickups from 1967 to 1977," says Scott Ibeling, Aplington, Iowa, who notes that "Ford's ram assist power steering used during those years has been plagued with perpetual problems."

Ford put the ram assist power steering on the 100, 150 and 250 4-WD's during the years 1973-77. Ibeling says the sensing valve, which directs power to a hydraulic cylinder, often causes problems.

"It's machined in such a way that

trucks often steer more easily one way than another. It almost always develops leaks that are hard to stop, and it often blows out hydraulic hoses. The ram is also a maintenance problem, and can actually be dangerous. If you hit a rock and you've got your thumbs locked in the steering wheel, you could break your thumbs when the wheel spins because the wheels will jam the cylinder," says Ibeling.

He sells a kit that lets you install an integral power steering box on the pickups. The kit fits all Ford 100, 150

and 250 pickups from 1967 to 1977, whether they were equipped with manual or ram assist power steering.

The kit consists of adapter plates, hardware and a special bit to drill the steering column. The adapter plates weld into place. You simply remove the existing steering box and replace it with an integral steering box from a Ford 2-WD pickup from the years 1969, which Ibeling says is easy to obtain.

"There are millions of them around in junkyards. Or, we sell reconditioned units with new seals for

\$150. The kit costs \$64.15. There are different kits for the 100 and 150 and 250 models. We also make a kit for 4-WD Broncos from 1974 to 1977," says Ibeling, adding that just the sensing valve alone on the old ram assist power steering sells for \$500 new.

Contact: FARM SHOW Followup, Scott Ibeling, 1014 Parrott St., Aplington, Iowa 50604 (ph 319 347-2491).