



# Case Study

## *Ceres, California makes root control pay*



**Ceres, a town of about 45,000, is named after the Roman goddess of agriculture, which befits its location near the center of California's rich and fertile Great Central Valley.**

**But as sewer network operators everywhere know, abundant growth can have a downside; cities spend millions of dollars annually controlling root growth in sewer lines. Left unchecked, root growth blocks pipes (or even breaks them apart) and causes backups. Since 2006, Ceres has been managing root control on their own, without using contractors, and can prove that doing root control in house saves money and is practical.**

Though Ceres now applies root control to their entire system, the initial impetus for getting into root control came from just one subdivision, Morrow Village. "It was built in 1957, and all the utilities and easements were put in backyards," explains Wastewater Systems Supervisor and Chief Plant Operator Terry Turner. "So, it's the only place in our network where we have to enter private property to do maintenance. Plus, the city has no control over plantings in backyards, so there are all sorts of trees and shrubs—that means lots of roots."

The Ceres sewer main network in the Morrow Village subdivision includes 6.25 miles of 6" and 8" vitrified clay pipe (VCP) running about six feet underneath backyards, and roots find their way into the VCP through mortar joints and small cracks. Once roots are in, they grow and expand rapidly, causing backups and damaging pipe. "Prior to 2006, we averaged 12 callouts per year for backups caused by roots, just in Morrow Village," Turner says. "Most of those were emergency callouts, costing us overtime and sometimes making it even harder to get into backyards without doing damage. It was an expensive problem, it affected service, and it was only getting worse as the clay pipes continued to crack." Given the location, replacing the VCP with HDPE or similar pipe was not an attractive option—trenching and replacing on private property is the kind of 'solution' that network managers like to defer as long as possible. In this area, flow is also an issue, and moving the sewer mains out to street right-of-ways would be a big project.

So, in 2006, Ceres assigned city staff to be trained in the use of the RootX herbicide and application system. The change since then has been dramatic; Turner now receives just two callouts per year in Morrow Village, and these are mostly for problems in the owner-controlled lateral lines. "It's nice," Turner says. "I can prove we're saving money, we're providing better service, and the callouts now are rarely emergencies—that means we can coordinate with owners, come out on a normal workday, and access is much easier for everyone."



## Why Herbicidal Root Control?

"We first saw RootX at a California Water Association trade show," Turner says. "We did some research, watched demos, and decided it was worth a try."

Ceres was attracted to this particular solution by several factors:

- The herbicide used was relatively mild, and has proved to have no significant downstream consequences. As a wastewater plant operator, Turner appreciates this: "It all comes to the plant eventually, and we haven't seen any effect at all. Only a small amount even gets to the plant, and it's less toxic than some herbicides—you could say it's non-detectable."
- Using the applicator, RootX foams up inside pipes, covering and killing roots, and leaving a residue on the entire pipe interior (not just within the flow line) that lasts for up to two years, discouraging root growth.
- Training was simple; "We read the directions," says Turner. "... and Jarrett (Jackson, from RootX) came out and worked with us in the field, with our equipment. It wasn't complicated, and we were able to start with our program immediately. Jarrett has continued to be very helpful if we have questions."
- The initial investment was minimal. Besides a vacuum/jetter truck, which Ceres already owned, the only equipment needed was a foaming applicator. RootX actually loans these as needed, but Ceres elected to buy their own. They've replaced it once since then, and not because it wore out; "The new applicator is an improvement in design. It's easier to use, saves a few minutes on every project, and makes things safer."
- Root treatment is relatively fast, compared to other methods, and in normal conditions lasts for two years.

The program started in Morrow Village. After CCTV inspection, Ceres established a biannual schedule that keeps roots under control. “We service the subdivision every two years, and we’re onsite approximately three weeks,” Turner says. “We work in 300-foot runs, from manhole to manhole (manholes are also in backyards), and we’re able to schedule the work with owners, so they can clear a path for us.” During this three week period, the city deploys:

- **A four-man crew.**
- **A combination vacuum/jetter truck.**
- **An easement machine—this is a small footprint piece of equipment, on tracks, that hooks up to the combination truck and provides control over jetting force without bringing the truck itself into backyards.**
- **A service truck.**

With this crew and equipment, the city is able to flush the VCP main lines and apply the foaming herbicide. . . and then they don’t have to come back for two years. The actual workflow is straightforward; crews set up the combination truck as near to the manhole as possible and move the easement machine into the backyard. After hoses are hooked up, actual pipe treatment begins with a flush of the pipe. “We always clean the pipe first,” Turner explains. “We use a nozzle we call a sand head, which is a little larger than the RootX applicator. Cleaning is important, because the treatment works better on vigorous healthy roots—they take up the herbicide more effectively.” In Morrow Village, due to the access issues, crews will proceed with herbicide foaming immediately after cleaning. Where access isn’t an issue, it is sometimes better to wait a few weeks after cleaning so that roots have time to recover and grow a bit before foaming.

Turner says that foaming has turned out to be a key factor in the success of Ceres’ root control program. “The foam coats the whole pipe, sticks to roots, and leaves a residue of herbicide on the upper pipe interior surfaces, where roots typically come in,” he explains. “That will stay active, killing off new roots that find cracks. It really works well, and unless we have some sort of storm event that floods pipes, the residual will stay in place for up to two years.”

In a 2016 report Turner prepared for Ceres’ Public Works Director Jeremy Damas, Turner listed the main benefits of using RootX once every two years in Morrow Village:

- Eliminating issues before they occur (preventative maintenance).
- Accessing resident’s back yards during a scheduled normal workday.
- Scheduled available man work hours.
- **Eliminating approximately \$6,000/year of overtime work.**
- Preserving the integrity of the V.C.P main lines until permanent repairs can be made.

One advantage of applying root control in a limited area, like a subdivision, is that it was relatively easy to measure results and return on investment—in effect, the root control program served as a large, well-studied pilot project. Obviously the results were encouraging, and Ceres is now extending the root control program to the entire sewer network.

## Good Numbers

Ceres, like most of California, has been experiencing drought conditions for several years. Counter-intuitively, drought actually exacerbates the root challenge, all over the city. “The thing with roots, especially in drought,” Turner says. “. . . is that the trees are not getting what they need in terms of moisture, so they dive in deeper and will seek out any little pinhole they can find. Drought has also led to a few more vacant houses, where plants aren’t being watered or cared for—that also leads to more aggressive roots.”

Although Morrow Village access issues were the main impetus for investing in a root control program, Ceres quickly extended the program to the entire network. Outside Morrow Village, root treatment is more reactive. The city has its own CCTV crew, and video inspects about 5% of the network annually. When root growth is identified by video or other means, RootX is applied, and the pipe area is scheduled for a follow up CCTV inspection.

At Ceres, hiring root control contractors was not seriously considered. “We really like to do things in house, to keep costs down,” Turner says. “It just makes sense to use our own manpower and to get more out of our investment in equipment. We’ve had companies submit bids, but they just can’t compete on price. So, we’ve elected to keep control.”

Basically, from the Morrow Village figures, Turner knows that Ceres is coming out ahead with the root control program. And on top of that documented return on investment, he also knows that he is maintaining the structural integrity of a sewer network composed largely of clay and ductile iron pipe, indefinitely deferring the costs of trench and replace or slip lining, and keeping sewer pipes flowing. Adding root control capacity to wastewater operations has been a clear win for Ceres, California.

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