



The Watering Pot

By Henry Alamzad

Due to the rising cost and increasing scarcity of water, and the costs and regulations associated with wastewater disposal, recycling of process water is now an integral part of several company operations. In many cases, an important feature of the recycling system is that it does an efficient job of cleaning the water in order to avoid contamination.



Leaves, peat moss and other debris are screened from up to 500,000 gal of water per day at this nine-acre greenhouse.

Such is the case with Catoctin Mountain Growers, a wholesale greenhouse that recycles up to 500,000 gal per day (gpd). In its 9-acre greenhouse and 3-acre outdoor space, the company produces 600,000 to 700,000 chrysanthemum and 200,000 poinsettia plants annually, plus a variety of bedding plants that it sells to major box stores like Wal-Mart and Sam's Club.

Catoctin raises chrysanthemums and poinsettias in pots set on a concrete floor, which is divided into 54 bays, each 4,500 or 9,000 sq ft. The plants are watered by flooding the bays sequentially to a depth of about 4 in. This totals approximately 10,000 gal in a smaller bay. Water is pumped continuously at a rate of 1,000 gpm from storage to the floor, then back to storage.

At the 10,000-gal main storage tank, the water is filtered to remove leaves, peat moss and other debris before being recycled.

The company previously used a cascading filter (a sloped screen) to remove this material, but it did not work well, according to Robert VanWingerden, owner of Catoctin. "It was a pretty fine screen, but it let debris fall into the tank, and this became a source of disease that caused problems with the flowers," he said.

The company replaced the filter with an electrically driven circular vibratory screener that has seemed to solve the problem, he said. The Flo-Thru Vibroscreen separator, made by Kason Corp., uses a 72-in.-diameter vibrating screen to remove debris

A wholesale greenhouse screens solids from recycled wastewater

tech update

Side-mounted motors reduce height of the screener, allowing it to fit between the ceiling and top of the storage tank, which was important for Catoctin because of the limited space between the top of the tank and the ceiling.



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before the water goes into the tank. "It does a good job—the water is clean," VanWingerden said.

For approximately eight hours a day, Catoctin cycles water from storage through the greenhouse and back through the vibratory screener. The company does not discharge water to the sewer and supplies water from a well or a pond to make up the 10% volume that is used by the plants.

With sufficient storage capacity to fill two bays and part of a third at one time, the company typically drains the first bay while the second is full and the third is being filled. Valves control the flow in and out of each bay. Water is retained for several minutes, drained to one of two 2,000-gal sump tanks and then pumped up to the 10-ft-tall separator mounted atop the main storage tank. Water recycled through the tank is retained in two 30,000-gal tanks for a total storage capacity of 70,000 gal.

The volume of water recycled per day ranges from 0 to 500,000 gal, because an individual bay may or may not be flooded on a given day. "It all depends on the type of crop, the size of the flowers and the ambient temperature," said VanWingerden.

Catoctin's separator has a single-screen deck of 145-mesh tensile bolt-ing cloth (TBC) with a 16-mesh TBC backing screen for reinforcement. The stainless steel screen is supported on a stainless steel frame that has radial arms for structural strength. The machine is powered by two unbalanced weight gyrotory motors—each 0.75 hp—mounted opposite each other on the unit's exterior wall. Wastewater is fed onto the center of the screen, and



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the vibratory motion imparted by the motors causes oversized particles to migrate to the screen's periphery, where they are discharged through a spout. Water falls directly through the screen and a funnel into the main tank.

The advantage of this design over single gyratory motors is that the bottom outlet can be located directly below the inlet, resulting in a straight-through flow path and higher screening capacity. This was important for Catoclin's needs, according to Christopher Dugan, the Kason representative who installed the machine.

The side-mounted motor configuration also reduces the screener's profile, which was important for Catoclin because of the limited space between the top of the tank and the ceiling. The separator, which is only 47 in. tall, fits into the restricted space with little room to spare.

VanWingerden had originally considered a textile cloth filter, in which water is pumped over a section of cloth that is periodically pulled from a large spool, but he instead opted for the Flo-Thru machine with a stainless steel screen because he "liked how it took the debris off, and you don't have to keep putting in new cloth."

On the other hand, silt left on the machine's screen at the end of the day dries overnight and slowly builds up over time. "Material would not build up if we operated 24 hours a day, but the screen is relatively easy to remove, so we take it out about once a month to flush it with water," VanWingerden said. *wqp*

About the Author

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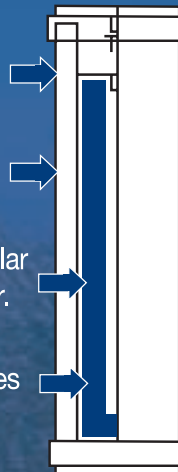
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