



Getting a grip on drainage

Standing water can encourage diseases and create a poor environment for plant roots and microbes

Most nursery plants won't grow in standing water. Nurseries should be designed with good drainage to minimize the time plants spend in standing water. PHOTO COURTESY OF JERRY WEILAND

BY EMILY HOARD

In areas like Oregon's Willamette Valley, with heavy rainfall and clay-rich soil, an effective water drainage system is essential to the success of a plant nursery.

Businesses like **Hostetler Farm Tiling LLC** in Canby, Oregon and **Creekside Valley Farms LLC** in Lafayette, Oregon, work with growers to assess their field drainage and install tiling on their properties.

Bret Hostetler is the owner of Hostetler Farm Tiling, which he described as a multi-generational ditch-digging outfit. "I took over from my father, and he took over from his father," Hostetler said.

The business has adapted to new technology over the years to make drainage systems more efficient. GPS replaced lasers and plastic tile replaced clay tile. "Instead of putting separate pieces of pipe in at one time, now there's one piece. That revolutionized the drainage you can put in," Hostetler said.

Paul Kuehne, president and tile manager of Creekside Valley Farms, has been working on field drainage for 15 years. He tiles his own property and also works with other farms.

"It's a very important step in any >>



Designing a field for water drainage in the first place can help mitigate problems later on. PHOTO COURTESY OF HOSTETLER FARM TILING LLC

Getting a grip on drainage



The tile system allows water to constantly drain off, minimizing crop losses and permitting growers to access the fields earlier in the season.

PHOTO COURTESY OF CREEKSIDE VALLEY FARMS

situation in the Willamette Valley with the amount of rainfall and the clay-heavy soil that doesn't allow water to drain cleanly, so it affects the rooting zone," Kuehne said.

Saturated soil can encourage plant diseases and it can create a poor living environment for the plant roots and microbes that are essential to soil health.

Poor drainage encourages disease

Standing water can encourage the spread of water molds like *Phytophthora cinnamomi* and *P. pulurivora*, said Nik Grünwald, Ph.D., a scientist with the USDA Agricultural Research Service (ARS) in Corvallis, Oregon. All *Phytophthora* and *Pythium* molds love water.

"They are notorious for needing standing water to move from plant to plant and eventually kill them with root rot," Grünwald said. "They need standing water to sporulate and the spores swim in the water from one plant to the other. Standing water makes the disease much worse."

But standing water isn't the only concern, according to Jerry Weiland, Ph.D., another scientist with the USDA-ARS.

"It can even get into irrigation systems and spread that way," he said. "*Phytophthora* is one of the most common nursery diseases I see when I'm out in nurseries and it's almost always associated with overwatering or poor drainage issues. Those pathogens reproduce rapidly

with excess water and take off."

Grünwald is a research scientist in the Horticultural Disease and Pest Management Unit and was hired to work on water molds including *Phytophthora ramorum*, which causes sudden oak death and also infects other woody ornamentals such as *Rhododendron*, *Viburnum* and *Pieris*. The Grünwald Lab studies the sequence of genomes of pathogens.

Weiland, a research plant pathologist, has been working for 17 years to improve disease control, including efforts to battle *Phytophthora* root rot.

Root and soil health

Hostetler said that with surface water or a high water table, roots become stressed and don't want to grow. The soil health is diminished because it's not the right environment for the microbes and worms that would help the roots flourish. Air is essential in the soil for things to grow.

"Sometimes where there's surface water the soil is impermeable and won't allow water to go down into the soil," Hostetler said.

Most plant roots need a gas exchange or else they will suffocate, Weiland said.

Nursery plants are not happy when their roots are wet, Grünwald said. Nurseries should be designed with good drainage to minimize the time plants spend in standing water.

Kuehne said tiling allows a plant to have deeper roots and are therefore more tolerant to stress and have more access to moisture.

Causes of poor drainage

Grünwald said poor drainage can occur if rainwater accumulates and stays in low areas, if land is not properly leveled to allow for runoff, or if the soil is compacted and does not allow for drainage.

Poor drainage could also be the result of soil composition. Soils rich in clay are made of smaller particles so they compact together and make it harder for water to drain out, compared to soils with sand that have larger particles that stay farther apart and leave room for quick drainage.

Hostetler said clay-heavy or tight soils don't allow for water to get below certain layers, creating a high water table. Repetitive machinery like a tractor on top of the same area can compact the soil and also make it harder for water to pass through.

Hostetler added that property owners need to consider their neighboring farms too in terms of where their water is draining.

Overwatering

Weiland said the number one cause of poor drainage in a nursery is watering more than what can drain away.

"Some nurseries water eight hours a day and in some cases an hour a day might be too much depending on the cir-

cumstances,” Weiland said. “If you start to see water puddling up, too much water was applied.”

Irrigation leaks can also be an issue if water is applied and never stops because the system is leaking.

Irrigating early in the morning and only as needed can help a grower avoid standing water as well. Weiland said the easiest way to reduce the risk of disease is to decrease the amount of water applied and increase the time between watering.

“What is the minimum amount of water for a plant to thrive?” Weiland said. “Another good tip is to not water or to reduce watering when it’s cloudy, cold or already raining. Plants aren’t using much water then and the ground is already wet.”

Solutions

There are many solutions to these problems. Grünwald said it’s important to map the waterflow through a nursery and understand where water can puddle. With that info in hand, the next step is to regrade that ground or add a better drainage system to make sure there is never standing water around the nursery plants.

Grünwald added it’s crucial to ensure irrigation water is free of pathogens by filtering and treating it with chlorine, ultraviolet or other water decontamination techniques.

“Avoid when pathogens can move from plant to plant and infect them,” he said.

Growers can test the water for pathogens. They can float rhododendron leaves in a water sample and see if lesions appear on the leaves after a few days.

He suggested using electronic watering systems that can calculate how much water a plant needs based on the weather and the plant’s evapotranspiration rate, or how quickly the plant takes up water and releases it into the air.

Hostetler said the first thing to consider is subsurface water control.

“That’s the only way to control how much water comes onto your land. You can’t control the rain,” Hostetler said. He recommended treating really bad areas with a surface inlet, which can let a large amount of water pass.

A French drain with drain rock can >>

Chamaecyparis
Sciadopitys
Kalmia
Thuja
Picea



Rhododendron
Boxwood
Prunus
Pieris
Ilex

Container and Field Grown Ornamentals

Phone: 503-663-1200 • Fax: 503-663-5134

www.reardonnursery.com
info@reardonnursery.com

10050 SE 282nd Ave
Boring, OR 97009



Looking for a health plan for your business, employees and family?

Providence Health Plan is proud to work with Leonard Adams Insurance to offer members of the Oregon Association of Nurseries access to quality, affordable healthcare.



Standard features available with our various health plans:

- Multiple plan offerings
- Preventive medications with a \$0 copay
- Chiropractic and acupuncture embedded for each member
- NEW for 2024: Option Advantage Plus plans offering a lab/x-ray benefit with the first \$500 fully covered



Additional member perks are available to cover other aspects of life, including:

- Personal health coaching
- Fitness center and workout video discounts
- Emergency travel assistance
- ID protection
- Savings on thousands of activities like movies, travel, or a night out on the town

Interested in learning more?

Visit lacoinsurance.com or contact Leonard Adams Insurance at **503-296-0077**, or toll-free at **866-907-1850**.

Getting a grip on drainage

be beneficial for smaller areas.

Kuehne said tiling helps protect the plants from too much standing water.

"Tile allows roots to grow deeper down into the soil so in the summer they have access to more water deeper in the soil," Kuehne said. He added that the longer roots provide a higher value for the plants. The tile system allows water to constantly drain off, minimizing crop losses and permitting growers to access the fields earlier in the season.

"When you're growing a high value crop like in a nursery, you don't want any part of the field damaged," Kuehne said.

He said investing in tiling is much cheaper than the cost of losing crops due to water damage.

"The ground is warmer so you can get out on the field sooner and you can till soil when there are wetter conditions," Kuehne said. "It just makes for a more

accessible area."

Hostetler said it's never too early to get ahead of surface water or field water issues.

"The sooner you do something about it the sooner you won't regret it. It's an investment in the land," he said.

Getting it right from the start

Designing a field for water drainage in the first place can help mitigate problems later on.

Grünwald said plants that are potted should have a clean gravel surface and plants that are not should sit on mounds so water flows away from them. Sometimes it requires installing pipes or gravel or regrading the land.

Weiland said to look for leaks in the irrigation system. Gauges can show a loss of pressure and indicate a leak. Another thing is to test for pathogens in recycled water and clean it with ultraviolet treatment. He

also recommended grouping plants together that have similar water requirements.

"Junipers and cacti don't need a lot of water so don't put them next to plants that need a lot," Weiland said.

Kuehne said nursery owners with a new property should call a company like Creekside Valley Farms to assess the drainage needs of that property and set up a plan for tiling.

"We are available to help consult and do installations on drain tile projects," Kuehne said. ©

Emily Hoard is an Oregon-based freelance journalist covering business, environmental and agricultural news. She has a background in community reporting and a master's degree in multimedia journalism. You can reach her at Hoarde123@Gmail.com.

A special issue all about shrubs!



Advertise in the June 2025 Shrubs Issue of Digger

This special yearly issue highlights shrubs, shrub growers, production techniques and much more!

Reserve your display ad by

May 1

Contact:

Curt Kipp

CKipp@OAN.org

503-582-2008

OAN.org/Ads