Vegetable Crop Updates

A newsletter for commercial potato and vegetable growers prepared by University of Wisconsin-Madison vegetable research and extension specialists

Extension
UNIVERSITY OF WISCONSIN-MADISON

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- Potato disease management in the post-harvest space (water molds and bacterial diseases)

Calendar of Events:

December 1-3, 2026 – Midwest Food Products Association Annual Convention & Expo, Processing Crops Conference, Wisconsin Dells, WI
January 17-19, 2027 – Growing Wisconsin Conference for Fresh Fruit & Vegetables, Kalahari, Wisconsin Dells, WI
February 9-11, 2027 – WPVGA/UWEX Grower Education Conference, Stevens Point, WI

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Funding Available for On Farm Nitrogen Research. The Nitrogen Optimization Pilot Program (NOPP) provides grants to farmers and their collaborators to conduct on-farm nitrogen research with the goal of optimizing nitrogen management, improving nitrogen use efficiency, and protecting water quality. In 2027, $1 million in funding is available to support new projects.

Explore your specific nitrogen questions and practical strategies to optimize nitrogen on your farm. Farmers, agronomists, county conservationists, and others interested in improving their N management are encouraged to apply.

Learn More & Apply. Complete the Intent to Apply by December 18th, 2026, and Final Application by January 15th, 2027. Review the Request for Proposals, Application and supporting documents Here!

NOPP is funded by the state of Wisconsin, administered by DATCP, and supported by UW-Madison. Reach out to DATCPNOPP@wisconsin.gov with any questions.

Why apply for NOPP? NOPP supports practical, farmer-driven research that generates locally relevant data and helps improve nitrogen management decisions on farms across Wisconsin.

- Farmers and collaborators get practical information to support nitrogen management decision making on their farms
- Learn together from results through field days, meetings, and other events
- Data collected through NOPP trials strengthen statewide nitrogen guidelines for nutrient management planning

Contact Megan Blauwet, megan.blauwet@wisc.edu, the Nitrogen Management Outreach Specialist at UW-Madison Extension with questions or ideas.



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Management of water molds and bacterial diseases of potato tubers in the post-harvest space. While every growing season typically offers a few weather hiccups, some years offer a few more extreme disruptions than typical. Extreme temperatures, in concert with moisture stress, exacerbate disease risk at the time of harvest and beyond. If test digs indicate pink eye (abiotic condition often resulting from high heat and moisture in the field), enlarged lenticels, or other physiological abnormalities, it's important to be watchful for disease. The disease descriptions detailed below may help you identify disease conditions of the crop for prescriptive decision-making at harvest and beyond. Some of the most common and problematic potato tuber diseases in storages include diseases caused by fungi such as silver scurf and Fusarium dry rot, and diseases caused by fungus-like or "water mold" pathogens such as pink rot, late blight, and Pythium leak. Bacterial soft rot should not go without mention. Each disease is promoted by slightly different environmental conditions, and each has key diagnostic features on tubers. **Highlighted in this article are the water molds and bacterial diseases of tubers.**



Pink rot symptoms on potato.



Late blight symptoms on potato.



Pythium leak symptoms on potato tubers.

Pink rot. *Phytophthora erythroseptica*, (or sometimes *Phytophthora nicotianae*) the fungal-like pathogen causing pink rot, often causes tuber symptoms initiating from the stolon end which appear rubbery, yet firm. The infected areas of tubers are often delimited by a dark line visible through the skin. Buds, lenticels, and underlying tissue are black and usually exude a clear liquid. When cut and exposed to air, pink rot infections turn pink-salmon in color after about 30 minutes. Pink rot is favored by high soil moisture which promote open lenticels and temperatures around 77°F.

Planting in well-drained fields with no history of pink rot, avoiding wounding at harvest and bin filling, and lowering temperature and humidity in storage can aid in management. Post-harvest treatment with phosphorous acid fungicides (such as Phostrol) can help limit the development of pink rot.

Phytophthora nicotianae was documented in commercial potatoes in several fields of Wisconsin, as well as other North American growing regions in 2018. While we have not yet detected this pathogen on tubers during test digs or post-harvest, it can cause tuber symptoms very similar to pink rot.

Late blight. Late blight, caused by another fungal-like pathogen *Phytophthora infestans*, produces tuber symptoms that can be both superficial and visible externally as dark brown to purple lesions and present in the interior as brown, dry, and granular lesions. This disease is favored by temperatures from 64 to 75°F and high relative humidity. Use of protectant fungicides in the production field while foliage is still viable is recommended. The use of fungicides with some systemic activity can aid in management.

Pythium leak. Pythium leak, caused by the fungal-like pathogen *Pythium ultimum* (now called *Globisporangium ultimum*) produces tuber symptoms that begin as light tan, water-soaked areas around a wound. As disease progresses, tissues can swell and periderm discolors with a dark line separating diseased tissue from healthy. Internally, the tissue is spongy and wet and may contain cavities. When squeezed, tubers infected by *Pythium ultimum* exude a watery liquid.

Over time, affected tubers in storage appear as empty, papery skins. This disease is favored by high temperatures, 77-86°F. Avoiding harvesting in hot, dry weather and enhancing post-harvest conditions to promote wound healing can help manage Pythium leak.



Bacterial soft rot. Bacterial tuber soft rot can be caused by *Pectobacterium spp.*, and more recently in the U.S., *Dickeya spp. Dickeya dianthicola* was confirmed in the eastern U.S. in just 2015. Seed infection can lead to blackleg symptoms including poor emergence, chlorosis, wilting, stem rot, and darkened slimy, black stems. Tuber infection can occur from movement of the bacterial pathogen within a plant infected from seed, or it can occur from late-season infection following wounding or damage at- or post-harvest.

Bacterial soft rot symptoms on potato tuber.

Although disease symptoms are often indistinguishable between *Pectobacterium* and *Dickeya spp*., *Dickeya spp.* appear to require lower inoculum levels in order to start disease, have ability to spread through the plant's vascular tissue better than *Pectobacterium*, are more aggressive, and require higher optimal temperatures for disease. Symptoms caused by *Dickeya spp.* tend to develop when temperatures exceed 25ºC (77ºF), while *Pectobacterium* predominate below 25ºC.

Tuber soft rot ranges from a slight vascular discoloration to complete decay. Affected tuber tissue is cream to tan in color and is soft and granular. Brown to black pigments often develop at the margins of decayed tissue. Lesions usually first develop in lenticels, at the site of stolon attachment or in wounds. *Dickeya spp.*, particularly at temperatures of >27ºC (80ºF), cause more severe rots than *P. atrosepticum* and are more likely to produce a creamier, cheesy rot.

To best manage bacterial soft rot of potato tubers, consider the following:

- Delay harvest up to 21 days post vine-kill to ensure complete skin set.
- Avoid wet soil conditions at harvest to prevent soil from sticking to tuber skin.
- Minimize cuts and bruises at harvest.
- If soft rot is present in a portion of the field, this part of the field should not be harvested. If infected tubers are stored, store them separately.
- Harvesting equipment should be cleaned and sanitized between lots.
- Provide adequate ventilation to reduce conditions favorable to bacterial infection. Check stored tubers regularly for temperature increase and odors. Spot treat problem areas to minimize spread.
- Reduce bacterial load on tubers as they enter storage and once in storage through use of post-harvest treatments such as chlorine dioxide, hydrogen dioxide, or ozone.
- Dry potatoes before storage or shipping.

Summary of Post-harvest Disease Management Strategies. While nature can be uncooperative in helping to limit post-harvest disease, there are cultural approaches and chemical tools available to mitigate infection and spread. Strong disease control programs during the production season are the best post-harvest storage disease control programs. Harvest temperatures should optimally fall between 12-18ºC (or roughly 54-64ºF) and soil moisture should be adequate to minimize damage. Care should be taken to minimize drops and subsequent bruising, which can become sites for post-

harvest infection. Once in storage, maintenance of good air movement, along with temperature and humidity appropriate to the variety, market type, quality status, and disease condition for optimum conditioning are critical.

The decision to make fungicide applications to potato tubers post-harvest is not trivial. The addition of water to the pile, even in small volumes necessary for effectively carrying fungicides may create an environment favorable to disease under certain conditions (limited airflow, field heat interacting with cool storage condition). Typically, post-harvest fungicides are applied in ≤0.5 gal water/ton (2000 lb) of potatoes. At this spray volume, an evenly emitted liquid will leave tubers appearing slightly dampened. If tubers appear slick or shiny with wetness, the spray volume is likely greater than 0.5 gal/ton or the emitter may not be properly functioning. Under some circumstances, for instance when tubers come out of the field in excellent condition and field history includes little to no disease concern, additional tuber dampness may be unacceptable and seen as a bin risk that outweighs any fungicidal benefit. In other circumstances, tubers may come out looking rough or with harvest damage, and field history includes pink rot or late blight. A scenario such as this may benefit from a post-harvest fungicide and resulting dampness should be mitigated by appropriate ventilation and temperature control.

The 3 sides of the disease triangle. Inoculum, favorable disease conditions, and susceptible tubers provide the 3 sides of the disease triangle. Avoiding or reducing inoculum on tubers as they enter storage will help considerably in preventing tuber infection in the bin. Free water, high CO2, and warm storage temperatures will promote disease development in storage. However, 2 of these 3 attributes are necessary in wound healing! The condition of the tubers themselves influences their susceptibility to infection by storage pathogens. In summary, management tactics such as segregation of tubers from wet field areas, fungicide application in the field, harvest management (temperature, moisture, handling), post-harvest fungicides, and storage management, are crucial to successful storage of potatoes.

A few fungicide notes to consider. Metalaxyl and mefenoxam resistance in *P. erythroseptica* (pink rot) has been documented in various regions of the U.S. While no late blight was identified in Wisconsin thus far in 2025, management of the predominant strain type of the pathogen in the US at this time (US-23) is generally sensitive to metalaxyl and mefenoxam and can be controlled by this treatment. I evaluated fungicide resistance in *P. erythroseptica* isolated from tubers in storage in Wisconsin roughly 10 years ago and resulted indicated that a portion of the isolates collected (~25%) were resistant to mefenoxam.

Phosphorous acid. Applications of phosphorous acid (H3PO3) on tubers entering storage or applied to foliage (2-3 applications) can significantly limit late blight and/or pink rot. Phosphorous acid treatment cannot reverse the effects of field-infected tubers, but it can limit the spread of disease during handling and storage. Post-harvest treatment can also limit silver scurf.

Field-applied phosphorous acid application has also been shown to provide residual control of pink rot to approximately 90 days after harvest. In our UW inoculated storage trial, phosphorous acid (Phostrol) applied at bin-filling at rates of both 6.4 and 12.8 fl oz/ton significantly limited pink rot incidence and severity at approximately 30 and 60 days post-treatment.

Phostrol at both rates also significantly limited late blight in a separate UW inoculated study. Stadium (Syngenta; active ingredients fludioxonil, difenoconazole, azoxystrobin) has demonstrated excellent control of late blight when applied at bin-filling due to the azoxystrobin component. However, please note that the label indicates use for silver scurf and Fusarium only, and does not indicate the use target of late blight or pink rot.

Hydrogen peroxide. Hydrogen peroxide studies carried out in Idaho showed that application immediately following inoculation provided nearly 30% disease control when compared to untreated controls. However, when tubers were infected in the field and were treated post-harvest, hydrogen peroxide did not provide adequate disease control. Our UW hydrogen peroxide study on pink rot and late blight control resulted in disease incidence and severity results that were not significantly different from our untreated control.