



POTATO STORAGE TIPS FROM THE EXPERTS

Two respected industry professionals share advice on storing healthy potatoes

By Joe Kertzman, managing editor, *Badger Common'Tater*

For more than 40 years each, Eugene Mancl of Ron's Refrigeration and Dale Nelson of Nelson's Vegetable Storage Systems have been working with potato and vegetable growers, helping them store disease- and bruise-free potatoes.

"I guess it's no secret that I've been doing this a long time," Nelson says. "I was fortunate to get into this

business early in my career and it just felt right."

"I worked in Idaho for two different companies," he adds, "and in Minnesota and North Dakota for another, and finally made it back to Wisconsin, totalling 42 years."

Mancl says, "Ron's Refrigeration was started in 1973, and we've been

Above: Dale Nelson of Nelson's Vegetable Storage Systems and Eugene Mancl of Ron's Refrigeration agree that smart phones and computer monitoring cannot replace visiting the potato storage daily for a visual check on the crop. Potatoes are in storage at the Hancock Agricultural Research Station.

working with potato and vegetable growers for about 45 years."

With no shortage of experience, the *Badger Common'Tater* editor sat down with Mancl and Nelson to get some tips and advice on storing potatoes.

Mancl's number one piece of advice to growers and/or brokerages/shippers who might store potatoes and other vegetables: "Take the time to have your equipment checked and calibrated before the storage season."

"Storage-related issues are avoidable if you or a technician takes the time to get your systems running and serviced before you plan to store," he adds.

Nelson says, "The storage is not a *hospital*! At best, it can maintain the quality of the crop being put into it. Although it is very possible to take



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a good product and make it marginal in storage.”

ATTENTION TO DETAILS

“The one piece of advice I would give the growers,” Nelson continues, “is, if at all possible [weather and time dependent], pay attention to details such as field hydration, harvest temperature, avoiding field low spots, etc.”

“Put the best crop you can into storage,” Nelson stresses.

Ron’s Refrigeration offers humidification and refrigeration services, as well as ozone, sprout inhibiting/Sprout Nip, Amplify and Shield.

Assuming the best route for potato growers and those storing produce is a combination of refrigeration and air flow with an application, Mancl was asked what a “best practices” scenario might be.

“The best practice can change considerably depending on the variety and intended use of the potato. Several factors can change the ‘best practices,’” he remarks,

Above: Dale Nelson, shown at his desk, says no two crops going into storage are the same, and that growing conditions, weather, soil types and other variables will change from one location to the next. Potatoes are shown at Alsum Farms & Produce in Friesland, Wisconsin.



“such as growing and harvest conditions, ambient temperatures during storage and even market demand.”

“For most growers, getting the crop harvested and into storage in cool conditions and avoiding high temperatures, heavy rain and frost is

the first goal,” Mancl adds.

Nelson’s Vegetable Storage Systems offers humidification, refrigeration and air flow services, as well as FruitGard, Smart Block and CIPC Clove Oil applications, and other post-harvest chemistries.

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NO TWO CROPS THE SAME

"The hardest part is no two crops going into storage are the same," Nelson says. "The growing conditions, weather, soil types and other variables will change from Spring Green to Central Wisconsin and even from Grand Marsh to Central Wisconsin."

"We try to work with each grower and develop a 'best practice' for their needs," he states.

Mancl says storage practices can change, but for the most part, cooling down the product and adding humidity is the primary focus.

"Ideally, using outdoor air with Humidcells and humidifiers is best, and plenty of fresh air," Mancl recommends. "Refrigeration is a great tool, but it's hard to beat Mother Nature's natural cooling."

As far as Sprout Nip, Mancl suggests treating a storage anywhere from

Above: Eugene Mancl of Ron's Refrigeration suggests that growers take time to have their equipment checked and calibrated before the potato storage season. Bushman & Associates potatoes are being piled in storage.

two to four weeks after the potatoes are stored and the pile has an opportunity to heal.

"We typically will treat a storage one time with either Sprout Nip or a Sprout Nip and Amplify combination," he explains. "If the grower intends on storing for a longer duration, we would do a reapplication in the late spring to protect the crop into the summer months."

"Sprout Nip [CIPC] has been the industry standard since 1960 and its effectiveness is unquestionable," Mancl adds. "By design, Sprout Nip

"The simplest things that you can't replace with a smart phone are sight and smell. Visit your storage and look around daily."
– Eugene Mancl



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prevents cell division on the potato, providing the most effective sprout control."

Amplify is a product that was introduced a few years back that prevents cell elongation on the potato, and when the two are combined, they produce a synergistic effect to provide longer sprout control.

POTATO FIRMNESS

"Many of our customers comment that they feel they get an increased potato firmness when using the combination application," Mancl suggests.

Shield is the liquid form of CIPC used in the grading operations to provide sprout control on the final product going to consumers.

For a normal storage season, sprout inhibitors are applied once in the first few weeks, and if potatoes are stored long term, a reapplication may be necessary.

"We also do a Jet-Ag application, which is a PAA [peroxyacetic acid] product," Mancl details. "We apply it in storage as a fungicide, bactericide and algicide for potatoes."

"This product is applied as soon as the storage is full and the doors are closed," he says. "We have found that a second application at a timed interval has been very effective in controlling silver scurf on potatoes in storage."

Ozone has been an important tool for many growers for the past two decades, with generators being used from the first day of storage until the potatoes are removed from the building.

"Ozone has proven effective in killing/controlling mold, fungi, bacteria and soft rot on potatoes in storage," Mancl relates.

He says that storage managers and growers have the most advanced air systems at their fingertips and that the technology is changing as needs arise.

SIGHT & SMELL

"The simplest things that you can't replace with a smart phone are sight and smell," Mancl remarks. "Visit your storage and look around daily."

Mancl also says that Wisconsin is fortunate to have some of the best potato and vegetable researchers in the world, along with great growers who care about their neighbors and are willing to help.

"I doubt they will run into anything that one of us hasn't seen before," he suggests. "My best advice would be: Don't be afraid to ask if you have a question."

"We hear from new and experienced growers every year with storage management questions," Mancl says, "and one thing I learned long ago was that you can't beat fresh cool/cold air."

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"Equipment will eventually wear out and technology changes," he adds. "Don't be afraid to invest in your farm's future and benefit from tomorrow's advancements today."

"A lot has changed in vegetable storage systems over the years," Mancl concludes, "and new technology and methods are being introduced regularly."

Nelson details a few things every storage manager/grower should understand:

- Air flow and how to manage it (not blowing too much air or too little)
- Should a potato crop be dried, and if so, how much?
- Humidity management
- Temperature management
- Understanding dew points in order not to condensate on the potatoes and spread disease

There are circumstances, Nelson says, where no sprout inhibitor is applied, normally for short-term potato storage.

"CIPC is still the main sprout inhibitor used," he says. "Normally, on process crops [chips and French fries], one treatment is all that is needed. We will also blend Smart Block with the CIPC on some of the long-term storages to increase the efficacy."

How long fresh market potatoes will be in storage and the variety

of potato will determine if CIPC is used alone or in a CIPC/Smart Block combination, Nelson details. For long-term fresh market potato storage, two treatments might be necessary.

If used as a standalone product, Smart Block will likewise take multiple treatments. "We will blend Smart Block with CIPC to reduce the amount of CIPC needed and give better sprout control," Nelson says.

"At this time, Clove Oil is the only organic sprout inhibitor and needs to be used multiple times," he adds.

CIPC, Smart Block and Clove Oil are all sprout inhibitors, with Smart Block and Clove Oil also having some effect on disease suppression.

FruitGard is a dry chlorine dioxide that comes in two different products—Wipe Out and Zeoair.

"We use Wipe Out shortly after the potato storage has been filled, giving it a little time to stabilize the pile," Nelson details. "There are two products we mix together, and the 'off' gas is chlorine dioxide."

SUPPRESSING DISEASE

"With the stronger dose of chlorine

*"The storage is not a hospital!
At best, it can maintain the quality
of the crop being put into it."*

– Dale Nelson

dioxide, we can take care of a lot of the disease pressure in the building," he adds. "This is normally a one-time dose unless we have extreme disease pressure, and then a second or a spot treatment can be applied."

Zeoair treatment is a long-term, low-dose treatment of chlorine dioxide.

"For probably 35 years, I was looking for a trickle charge of disinfectant that could be used all the time in storage. I wanted it to be safe, easy to use, and most of all, work," Nelson relates. "This was it!"

"Zeoair has exceeded all expectations as far as containing disease in potatoes, and in some case, drying them up," he states. "It has become a great management tool for the growers and processors, and best of all, it is stress-free to the potatoes."

Through computer monitoring, growers and shippers can view storages on their phones at any time.

"The best advice I can give them is to make a trip to the storage and take a walk through," Nelson recommends. "This should be done, if not every day, at least every other day."

"We can still see and smell better than any computer and detect small problems while they can still be corrected," he stresses.

"Know the product going into storage, field and growing conditions, and harvest temperatures and conditions," Nelson stresses. "So often there is a disconnect between the storage team and agronomy."

