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NEXT CPAC MEETING

The next meeting of the CPAC (area II) will be held April 15th, at **7:30pm**, in the CPAC office conference room.

LOOKING FOR VOLUNTEERS

CPAC will be filling at large positions on all of its sub-committees at its May meeting. This is an excellent opportunity to be part of one of the most progressive state potato organizations in the country. Please call CPAC if you would be interested in serving on any of the following committees: Marketing, Research, Education, Industry Relations, Policy/Finance, or Governmental Affairs.

Kurt Holland to Represent Colorado on United States Potato Board

Kurt Holland of Monte Vista CO, was seated as a Board Member on the United States Potato Board (USPB) at the organization's 38th Annual Meeting. Holland has been the sales and transportation manager at Mountain Valley Produce for six years. To the US potato Industry, Kurt brings a progressive, aggressive attitude along with a strong interest in developing demand for Russet and specialty potatoes. He is a member of the CPAC marketing committee and a graduate of the 2007 Potato Industry Leadership Institute. Kurt and his wife Leona have two sons Jesse age 16, and Kenny age 12, and they all stay busy with youth sports, motorcycles and camping.

DOUG MONTER SCHOLARSHIP applications due by April 09, 2010

Graduating male seniors should contact their school counselor or the CPAC office for information and an application regarding this annual CPAC scholarship.

CRANE FESTIVAL THANKS TO MANY

Carla Worley, Carl Worley, Hunter & Carole Sessums, for set up, Danny Neufeld, John Patterson, Mark Peterson, CJ Robinson, Reagan Bush, Keith Holland, Brett and Carrie Deacon, Preston Stanley, Byron Kunugi, Tom Ford, Ken Burbach, Miguel Diaz, Sherrel Mix, and Dwayne Weyers for working in the booth and educating visitors about the Colorado Potato Industry. We especially thank Hi-Land Potato, Rockey Farms and Mountain Valley Produce for furnishing potatoes to sell with the proceeds going to help the upcoming Potato Festival.

AG DAY AT THE CAPITAL: Bob Mattive, Miguel Diaz, Byron Kunugi, and Mike Mitchell for delivering 250 5 lb. sacks of potatoes and Colorado cookbooks to the Colorado legislature and staff. A special thanks to Hi-Land Potato for donating and packaging the potatoes.

NPC NEWS

It was a year ago that I wrote about the impending loss of the sale of frozen potato products to Mexico because of import tariffs applied by Mexico in retaliation for the United States Congress eliminating funding for a pilot program that allowed Mexican trucks into a limited area within U.S. border states. So what has happened since then? Despite the best efforts of the NPC as a member of the Alliance to Keep U.S. Jobs there is no solution yet. As predicted a year ago exports of U.S. frozen potato products are down more than 50 percent from the previous year. At what cost to U.S. producers? Roughly \$30 million in lost sales while Canadian exports have grown by an equivalent amount. According to Matt Harris, director of trade for the Washington State Potato Commission, Canadian trucks are rolling right through the U.S. into Mexico loaded with french fries. This week ConAgra Lamb Weston announced the closure of its potato processing plant in Prosser, Washington which employed 250 people.

A year ago I wrote that although this situation may not affect Colorado growers directly it could lead to potato acres originally destined for processing being routed into fresh market channels and in turn affect market balance. There are many reasons potato prices are depressed this year but when potato exports account for roughly one out of every 6 rows of potatoes grown in this country the importance of exports, or in this case loss of exports, can't be emphasized enough for all growers.

For more than eight months high ranking administration officials, including Secretary of Transportation Ray La Hood and United States Trade Representative Ron Kirk, have indicated that they are working on identifying a solution and understand the sense of urgency. The

Colorado NPC delegation stressed the need for a solution to the Colorado legislative delegation when we visited in February. Let's hope they were listening and will quickly create a solution to this issue.

TRACKING POTATOES FOR LIVESTOCK/ DISPOSAL

The CPAC committee is asking that you please contact the CPAC office to report the amount of any potatoes that you have disposed of for livestock feed or quality issues. This information is very important to updating government reports of potato stocks on hand. This information could impact potato markets and area shipment projections. Individual grower information will remain confidential but area wide information can be tabulated and then passed on to the U.S.D.A Agriculture Marketing Service and N.A.S.S. This could have a positive impact on potato prices so please take a few minutes to contact C.P.A.C.

COLD STORAGE FACILITIES ELIGIBLE FOR USDA FACILITY LOAN PROGRAM

As a direct result of the 2008 Farm Bill the U.S.D.A. recently amended the Farm Storage Facility Loan program to provide low-interest financing to build cold storage facilities for fruit and vegetable storage. To be eligible the cold storage facilities must have a useful life of fifteen years. In addition to building new cold storage buildings the loan can be used for permanently affixed cooling, circulating, monitoring and electrical equipment upgrades including labor and materials for installation of lights, motors, and wiring integral to proper operation of the cold storage facility. As with any government program there are many eligibility requirements. If you are interested please contact your local county Farm Service Agency office.

SEED LAW UPDATE

SB10-072 will be in the House chambers on April 5th for third and final reading. It has already passed the Senate. If it passes the House next week it will then be ready for the Governor to sign into law. The next step will be public rulemaking by the Colorado Department of Agriculture which will take place this summer. Please contact Jim if you have any questions.

APRIL CALENDAR

4/15 CPAC meeting
 4/26-29 State Managers Public Policy Wash DC
 5/20 CPAC meeting

MARCH SPUD FACTS

		<u>2010</u>	<u>2009</u>	<u>2008</u>	<u>2007</u>	<u>2006</u>
Shipments	480 cwt equivalent	4191	3823	3460	4016	4361
Reds	percentage of crop	3.5	1.3	4.2	3.4	2.6
All Russet Varieties	percentage of crop	83.9	89.2	85.2	85.9	82.9
Yellows	percentage of crop	8.0	3.9	7.0	1.6	5.4
Other Varieties	percentage of crop	4.5	5.7	3.7	9.2	9.1
U.S. No. 1	percentage of crop	56.8	54.1	57.3	56.4	56.8
U.S. No. 2	percentage of crop	4.3	4.9	6.4	5.0	6.4
U.S. Commercial Grade	percentage of crop	26.0	28.1	25.3	22.0	22.9
Seed	percentage of crop	12.9	12.9	11.1	16.3	13.8
Bulk	percentage of crop	44.8	45.7	40.6	44.7	42.5
Total rail shipments		27	16	0	184	176
Total truck shipments (fresh)		3966	3475	3198	3473	3810
Total truck shipments (processing)		199	332	262	359	375
Total shipments for the year to date		22093	20993	22307	23087	24409

Average F.O.B. prices for March (per 50 lb. carton or bale unless noted)

		<u>2010</u>	<u>2009</u>	<u>2008</u>	<u>2007</u>	<u>2006</u>
Reds	U.S. #1 2 ½" -3 ½"	n/a	n/a	14.26	n/a	n/a
Reds	U.S. #1 size B	n/a	n/a	13.75	n/a	n/a
Yellows	5# packages	n/a	n/a	9.88	n/a	n/a
All Russets	U.S. #1, non-size A/A	4.25	6.55	6.54	5.55	6.18
All Russets	U.S. #2(2007-50#,10# pack)	3.05	5.63	4.75	4.58	8.73
All Russets	10 oz. Minimum	n/a	n/a	n/a	n/a	n/a
Bulk Russets	U.S. Commercial Grade 100 lbs	4.56	9.69	10.66	7.38	9.28

Extension



Horticulture
& Landscape Architecture



Late Season Potato Storage Management

Sastry Jayanty, Assistant Professor and Potato Extension Specialist
San Luis Valley Research Center

Preharvest assessment is important to decide on how long tubers can be stored based on tubers exposure to stress such as:

- temperature extremes
- nutrient excesses or deficiencies
- water stress
- physical damage
- other unfavorable growing conditions

Potatoes are stored successfully when the tubers are grown and harvested under favorable environmental conditions and by following recommended agronomic practices. It is not often that Mother Nature cooperates fully with the grower. This leads to the development of physiological disorders and disease problems during long term storage. Physiological disorders in storage are specific to particular cultivar. Disease problems that arise in storage are due to several factors, such as environment, crop condition, harvesting and handling, initial storage conditions, and holding conditions. In storages, remedial measures are often taken after problems are identified. Several potential problems can be avoided or reduced by a careful understanding of the conditions that lead to problems, and the necessary adjustments that can be adopted. Proper storage management can help salvage problem tuber lots. Proper storage management will never improve a poor quality crop.

The storage manager has the job of monitoring the storage daily to make certain that the temperature, humidity, and CO₂ are within the prescribed levels. The storage manager should also consider the following seven points to decide on how long he can store quality tubers.

- Preharvest assessment
- Air quality
- Sprout inhibition
- Temperature and humidity
- Bin Emptying
- Physiological disorders
- Disease issues

Preharvest assessment:

It is wise to assess the quality of tubers before putting them in long term storage. Potatoes affected during the growing season by stress conditions such as temperature extremes, nutrient problems, water stress, physical damage, or other unfavorable growing conditions may not respond to storage environments equally.

Potatoes that are bruised or damaged during any part of the harvesting, hauling, piling, or storing operations may require additional considerations for proper storage management. Bruised tubers require more air movement to bring down temperature because they respire

twice as much as healthy tubers. Even if tubers have up to 5% wet rot or damage by frost they can be stored successfully if proper procedures are employed to eliminate excess moisture. Tubers with severe stress related problems such as sugar ends or jelly ends should not be stored.

Air Quality

Potatoes, like any other living vegetable, respire by taking in oxygen and producing carbon dioxide to survive during the storage process. Stored tubers are living organisms, which produce heat through respiration and lose moisture (shrink) through respiration and evaporation. The potato tuber produces sugar from the starch stored in it for respiration.

The level of stress prior to storage and during storage increases the respiration rate of the potato, thus increasing the need of sugar that is required for respiration. In general, any type of stress causes respiration to increase. Mainly in storage, conditions such as lack of fresh air

(O₂, CO₂), handling, temperature fluctuations and exhaust gas accumulation (CO, C₂H₄) cause stress. Extreme cold or unseasonably warm weather will influence the operation of the ventilation system in maintaining the proper temperature. This may cause an increase of CO₂ concentration in the storage atmosphere. Reducing stress levels in the field and in the storage reduces respiration levels, therefore reducing shrink losses.

Long term storage conditions

Temperature: 38-40F

Relative Humidity: 95%

Carbon dioxide levels: 3000ppm

Minimum oxygen levels: 5%

Sprout Inhibition

Regulating dormancy and sprouting is an important aspect of potato storage management. Sprout inhibition is essential to maintain tuber quality for the table and processing markets. Sprouting causes tuber dehydration, physiological aging and affects the appearance of the tuber. Sprout inhibition is achieved through a combination of proper storage management and the use of a sprout inhibitor. Two sprout inhibitors are primarily used; MH30-which is applied in the field and Chlorpropham (CIPC) - which is applied to potatoes after harvest in storage. CIPC is the most effective post-harvest sprout inhibitor registered for use in potato storages. CIPC must be applied after the wound-healing period is over but before dormancy break or initiation of sprout growth.

Occasionally, stored potatoes that have been treated with CIPC have internal or external sprouting problems. Inadequate sprout inhibition is often thought to be a result of application factors, such as incorrect application rate or timing. However, numerous factors such as disease, excess dirt restricting air flow, and/or plugged air vents may cause sprouting problems in storage.

Knowledge of varietal differences in dormancy length is important for successful long-term storage. Each variety may react differently to CIPC. The application of CIPC should be timed to ensure that the sprout inhibitor is applied early enough in the storage season.

Storage temperature and relative humidity

Optimal holding temperatures for potatoes in storage depend on the potato variety and the intended end use of the product. Potatoes intended for fresh market may be stored between 38° and 42°F, while those intended for seed are usually stored at 38° to 40°F. Storage temperatures are also used to minimize weight loss caused by respiration and shrinkage. An increase or decrease in potato storage temperatures can also be used to minimize disease development. By reducing holding temperature, many storage disease problems can be minimized by slowing the disease development and spread.

Temperature changes in storage should be gradual and not exceed recommendations. In general, temperature reductions should not exceed 0.5°F per day when cooling to specified holding temperatures. This gradual temperature reduction helps to maintain pile temperature differential to a minimum. Guidelines for proper holding temperatures in storage may vary with the cultivar.

Most of the tuber shrinkage that occurs during the first month of storage results from water lost before the completion of the wound healing process. Maintaining high relative humidity (95%) in potato storages prevent some of the early season tuber dehydration and helps control the total shrinkage loss during the storage season. Shrinkage in storage is directly proportional to the length of the storage season and inversely proportional to the relative humidity conditions maintained within that storage.

Bin emptying

The same levels of relative humidity should be maintained until the bin is completely empty. Adjust air movement, taking into consideration the amount of tubers left in the bin, to reduce shrink. Maintaining minimum 45°F pulp temperature during transport to reduce bruise damage is recommended.

Physiological Disorders:

Stress caused during growing season and at harvest due to environment and handling practices can lead to external and internal physiological disorders. They can significantly affect storability and marketability.

<i>Disorder</i>	<i>Preharvest and harvest recommendations</i>	<i>Storage management recommendations</i>
Pressure Bruise	Make sure field is not completely dry after vine kill	Floors should be wet and humidity is running while loading the bin Maintain storage humidity above 95% RH Cool gradually to the final holding temperature (0.5°F) Limiting pile height to 18 feet.
Black heart	Insufficient oxygen reaches the interior of the tuber resulting in sharply defined, purplish-grey to black area in center.	Provide good air circulation to prevent heating and oxygen deprivation; avoid chilling injury
Chilling injury	Avoid harvesting when the air and pulp temperature (50°F) Cover potato trucks with	Store tubers above 37 °F

	tarps	
Freezing injury	Monitor the air and pulp temperature Cover potato trucks with tarps	Store tubers above 37 °F
Black spot	Avoid over-fertilization with nitrogen and irregular irrigation Improve soil potassium availability	Minimize bruising; Warm to 60 °F before grading

Storage Disease Management

Many post-harvest disease problems are associated with field locations where water saturation or excessive soil moisture occurs. These areas need to be identified before harvest so that the resulting tubers can be stored separately and moved out quickly. Adverse environmental conditions at the time of harvest can cause bruises and wounds on tubers and also make them susceptible to diseases.

Disease (pathogen)	Preharvest and harvest recommendations	Storage management recommendations
Soft rot (<i>Erwinia carotovora</i>) black leg	Avoid harvesting immature tubers Avoid over irrigation during growth and harvest	Increase airflow to those infected areas to prevent the spread and reduce free moisture
Dry rot (<i>Fusarium sambucinum</i>) seed and soil borne fungus	Assure proper skin set and maturity of the potatoes before harvest Dry rot can only infect tubers through wounds in the tuber skin, which occur mainly during harvest or handling.	Effective wound healing is the key Curing at 55°F with 95% relative humidity encourages wound healing. Wound healing is complete in 2 to 3 weeks
Pink rot (<i>Phytophthora erythroseptica</i>) soil borne fungus	Tubers coming from field locations with saturated soil conditions Avoid excess watering late in the season if temperatures stay above 75 °F	It may spread in storage if a secondary bacterial infection occurs. Control measures include constant fan operation to dry out the infected tubers. Avoid harvesting, if harvested, sort and discard these potatoes
Pythium leak (<i>Pythium ultimum</i>). soil borne fungus	Harvest wounds in connection with high tuber temperatures Wet spots in the pile at the beginning of storage are usually associated with Pythium leak Avoid excess watering late in the season if temperatures stay above 75 °F	If significant amount of potatoes are affected it is advisable to cure between 45°F to 50°F for minimum of 3 weeks and rapid cooling the potatoes to 38-40°F Avoid harvesting, if harvested, sort and discard these potatoes
Silver scurf, (<i>Helminthosporium</i>)	Avoid late planting and harvest Chemical treatments at the time	Silver scurf spreads in storage, resulting in an increase in both

<i>solani)</i>	of bin loading can be effective	disease incidence and severity Lower relative humidity and storage temperatures to limit surface growth of the fungus. However, reducing the humidity and decreasing the storage temperatures may limit marketing strategies.
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If you have any questions or comments, and for more information about the content of this document please send e-mail to sastry.jayant@colostate.edu. (April 2, 2010)