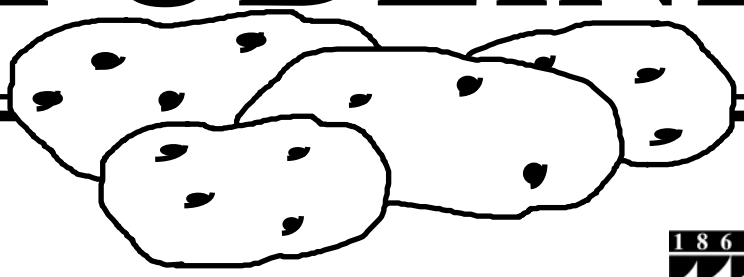
SPUDLINES



DECEMBER 2002
VOL. 40 NO. 3

CONFERENCE ISSUE

THE UNIVERSITY OF MAINE Cooperative Extension

Dear Potato Grower,

This first fall issue of SPUDLINES after the harvest of the 2002 crop. In this issue, we are enclosing the program for the Eighteenth Annual Maine Potato Conference and Trade Exhibit. The conference will be at the Caribou Inn and Convention Center on January 22 and 23, 2003. The trade show again promises to be interesting and informative. License recertification credits will be available for those holding a valid license from the Maine Board of Pesticides Control as will CCA credits for those so certified (call 760-9ipm for details). Be sure to attend and support the exhibitors at the booths.

The Maine Potato Board is holding their annual meeting the evening of January 24, 2003. We hope to see everyone there. Don't miss it.

This publication is in part supported by a grant from the Educational Committee of the Maine Potato Board. The potato growers, processors and brokers of Maine pay assessments. Portions of these assessments were approved for the educational purpose of keeping Maine potato growers and related Maine industry people informed.

Sincerely,

Steven B. Johnson, Ph.D.
Crops Specialist

Upcoming Programming of Interest

January 14-16	**Augusta Trade Show** Civic Center, Augusta
January 22-23	**Annual Extension Potato Conference** Caribou Inn and Convention Center, Caribou
January 24	**Maine Potato Board Annual Meeting** Presque Isle Inn and Convention Center, Presque Isle
February 7	**CCA Exam** Cooperative Extension, Presque Isle

For further information, call 764-3361

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MANAGING POTATO STORAGE UNDER DISEASE PRESSURE SITUATIONS

Steven B. Johnson, Ph.D.
Crops Specialist

Potatoes are stored successfully when the storage environment conditions are set to match the requirements of the crop and the purpose for which it is stored. Storage disease problems arise due to several factors, namely the crop condition, the harvest and handling conditions, the initial storage conditions, the holding conditions, and sometimes the external environmental conditions. Very often corrective measures are taken after problems are identified.

One of the key factors a direct bearing on the storability of the potato crop is the physical condition of the potato brought into storage. Ideally, potatoes are harvested when the following conditions are met: good skin set, availability of cool air during the night time, appropriate soil moisture to move the harvester without clods, and In some cases the condition of the soils and pulp temperatures may be extremes, and therefore necessary adjustments in the initial storage settings may be required.

Ideal initial storage conditions and its implications

Ideally, potatoes are harvested when the pulp temperatures are around 60 degrees F, and for this condition the initial storage temperature is set 5 degrees lower than the harvest pulp temperature. A continuous supply of air, at a slow rate, will help equilibrate the pile temperature, reducing the chances of temperature differential in different areas of the pile. The relative humidity should be maintained at 90–95 percent. Once the storage is filled to capacity the temperature of the pile should be maintained at 50–55 degrees F for two weeks to cure the potatoes. This include the time for bringing the pulp temperature to 50–55 degrees F. Once the curing is complete the pile temperature is cooled to the holding conditions. The holding temperature is determined by the end use of the potatoes. Though this practice is the norm, there may be exceptions. For example, if a bad infection of soft-rot or Pythium is suspected, the best curing temperature is below 50 degrees F, which means the actual set temperature is much lower when the storage is being filled. In some cases initial storage temperature is set at 49–50 degrees F during the entire filling period, and fans are run only at the nighttime for three to four weeks. Subsequently, the pile temperature is decreased gradually at the rate of about 1 degree F a week. This procedure is continued until the potatoes are brought to holding temperature.

One of the toughest situations potato storage managers can face is the realization that they have a potato pile in storage seriously in danger of deteriorating due to diseases and disorders. From a management standpoint, anticipating such problems is half the solution. Here is information about storage diseases and ways to minimize the problem.

Storage diseases and how to minimize them

Pink rot: If pink rot is detected after the potatoes are in storage, provide adequate airflow through the pile. The early curing condition should be 45–50 degrees F for as long as it takes to dry the potatoes. If only a small portion of the pile is affected, the healthy potatoes should be cured at 50 degrees. Subsequently, a rapid cooling to holding condition may be advantageous. Continuous airflow is a must during this period.

Pythium leak: If significant amounts of potatoes are affected with Pythium leak, cure between 45 and 50 degrees F for minimum of three weeks. If the disease persists, consider rapidly cooling the potatoes to 40–45 degrees. Provide continuous forced air until the affected areas are dry. Reducing the humidity during this process will facilitate drying.

Bacterial soft rot: Bacterial soft rot can be a real problem in storages. There is little information to support the use of bactericides or disinfectants through humidification to directly control bacterial soft rot in storage. If a high percentage of soft rot is noticed during storage loading or the early storage phase, use little or no humidity with continuous airflow. If soft rot is seen after the curing phase, the cool down to holding conditions should be rapid with a lot of air movement through the pile. Prevent condensation in and on the potato pile. Ventilation systems are available that can provide a continuous but low speed supply of air for better temperature equilibration within the pile. This prevents free moisture formation within the pile and also provides oxygen. Use supplemental air in severely affected areas of the pile.

Adjust your storage management approaches to harvest conditions

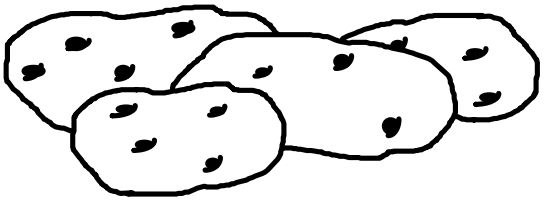
Here are some general approaches to storage management under differing harvest conditions:

- *For extremely warm and dry soil harvest conditions:* Run the fans and the humidifier continuously during filling the storage and for the first day or two. Modulate the air entering the pile to no less than 5 F of the pulp temperatures. Gradual cool down is better than rapid cooling.
- *Cool weather (50–60 degrees F) with dry soil harvest conditions:* The potato pulp temperatures are already at or around curing temperature. In this case, run fans intermittently, so that the pile temperature equilibrates. This will also help to provide the required oxygen for curing the potatoes.
- *Cool weather (50-60 degrees F) with wet harvest conditions:* Wet conditions on the surface of tubers will encourage diseases and also block air exchange through the lenticels. If the pulp temperatures are near curing condition the fans need to operate continuously without any humidification. This will dry the surface of the tubers. The plenum air entering the pile should be slightly lower (1–2 degrees F) than the pulp temperatures.
- *Cold weather (40–50 degrees F) with dry soil harvest conditions:* Humidification is required in this situation and can be timed along with the fans. If cold weather persists while filling the storage, continue the intermittent

fan operation with humidity until the storage is filled and closed.

- *Cold weather (40–50 degrees F) with wet soil harvest conditions:* The first requirement as soon as the potatoes are brought into storage is to dry the surface of the potatoes, so a continuous run of the fans may be required without any humidity added. The cold, wet condition may slow down the drying. When drying is complete, intermittent ventilation will provide the required oxygen and at the same time accumulate a little of the heat of respiration to warm the pile.
- *In some situations the weather stays warm at harvest time.* If the weather is too warm during the day (pulp temperatures at or above 80 degrees F), the best time to harvest is in the morning or late evening hours. It is important to note that if the warm weather persists the primary objective in storage should be to remove the field heat. These potatoes should be cooled as they are put into storage using ventilating air at 50–55 degrees F. This temperature, along with 90–95 percent humidity, is ideal for potato suberizing and wound healing.

Parts were adapted from, "Potato Storage Management for Disease Control," University of Idaho

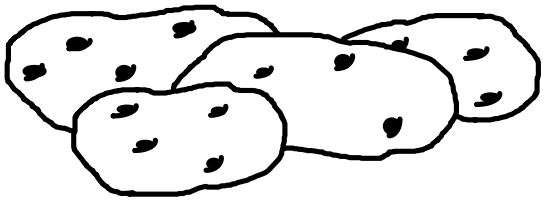


SEED PROMOTION EFFORTS CONTINUE

Steven B. Johnson, Ph.D.
Crops Specialist

The Maine Potato Board continued its seed promotion efforts in marketing the 2002 seed crop. Seed growers Kendall Shaw, Dave Bartlett and Brent Buck traveled to Florida in November to visit markets and Florida growers. In East Palatka, at the Putnam County Agricultural Center, Steve Johnson presented an educational program on Potato Mop-Top Virus to growers. Don Flannery gave a growing season review and promoted the high quality of Maine seed to the audience. Field visits with the Florida growers proved very informative. Several seed dealers also made the trip and took the opportunity to visit customers. It was a pleasure to hear all of the positive comments about the high quality of Maine seed.

In a separate trip in December to North Carolina, seed growers Kyle Blackstone, Steve Whited and Andy McGLinn visited potato growers in the Elizabeth City area. At the Pasquotank County Annual Potato Conference, Steve Johnson presented an educational program on Potato Mop-Top Virus to about forty seven growers. Tim Hobbs presented a growing season review and promoted the high quality of Maine seed. North Carolina growers are very supportive of Maine seed and are pleased with the quality they are receiving. It was also very pleasing to learn about the cooperation between the researchers from the University of Maine and North Carolina State University on plant breeding.



CANOLA: SOME LESSONS LEARNED THIS PAST SEASON

Peter Sexton, Ph.D.
Crops Specialist

This past season about 2,400 acres of canola were grown in northern Maine, with yields ranging from 1,500 up to 2,200 pounds per acre. At a recent grower meeting, organized by the Agricultural Bargaining Council, , several issues were raised that I will try to review here.

Timing of harvest

The number one difficulty growers faced this past season was timing of harvest to minimize shatter losses. Canola is really a modified weed—which is a good thing in many ways. It is an efficient, competitive plant; but it has not had the tendency to shatter bred out of it yet. Furthermore, it sets seeds sequentially from the base of the plant upwards. So the seeds at the top of the plant are younger than those at the bottom. This means by the time the seeds at the top are mature enough to harvest, the ones at the bottom are past maturity and quite prone to shatter. For this reason, most of the canola acreage in the Great Plains is swathed. Swathing helps the younger seeds catch up, promoting even maturity and decreasing the risk of severe shatter losses.

What is the optimum time to combine canola?

Most of the literature on this subject suggests combining at 10 or 11 percent moisture. A large factor in this recommendation is that canola seed doesn't store well at moisture greater than 10 percent. However, in our situation canola is shipped directly out of the field to a processor in Quebec. Therefore, storage is not the same concern here as it would be for growers in other regions who may wish to store their grain for later marketing. The drying charges for canola this last season were as follows:

percent moisture	drying cost ($/bu)
10.0	0.00
10.1	0.17
11.0	0.21

12.0	0.26
13.0	0.31
14.0	0.37

There is an initial, significant charge (17 cents a bushel) for canola that has reached 10.1 percent moisture, for diverting the grain to a dryer. After this, the drying costs increase about five cents per bushel with each full percent increase in moisture. One really can't avoid the bulk of the drying charge unless you wait until the grain is down to 10.0 percent moisture or less. In the meantime, the risk of loss from shattering increases as the plants dry down.

Let's consider an example to see how drying costs might compare to the cost of shattering. At 12 percent moisture, a grower would be charged 26 cents per bushel for drying costs. If we assume a price of $5.50 per bushel for canola, this represents about a five percent loss in revenue. It is harder to measure loss in revenue from the shattering that can accompany delayed combining, because we don't have data on shattering losses versus percent moisture at harvest. However, there has been work done on shattering losses with swathing versus direct cutting, which shows that on average about 10 to 12 percent more of the crop is lost to shattering with direct cutting than with swathing. In some trials where there have been high winds, shattering losses have exceeded 50 percent in direct cut systems. So it appears that typical shattering losses are on the order of 10 percent of the crop, with the potential to be much worse in windy weather. Therefore, direct cutting a crop and combining on the moist side (12 to 13 percent moisture)—and paying the five to six percent drying costs—gives the advantages of being able to combine more on your own schedule, while decreasing the risk of shattering. There were not any problems reported with green seed (from harvesting an immature crop) at the meeting, but this is something you should look for when deciding to combine or not.

The speed at which canola can dry down is an additional factor to consider. By my measurements this past season, the grain might dry down less than one percent per day, or as much as four percent or more over the course of a single day, depending on conditions. If the process of drying down is erratic due to rainfall or heavy dew, it may be rather difficult to predict when the grain will hit 10 percent moisture, and then it may be eight or nine percent moisture by the time it is dumped in the truck. This also argues for combining a little on the moist side as it is a little easier to schedule operations. The grower who swathes has a little more latitude in deciding when to combine, but shattering would still be a problem to contend with.

Seed rates

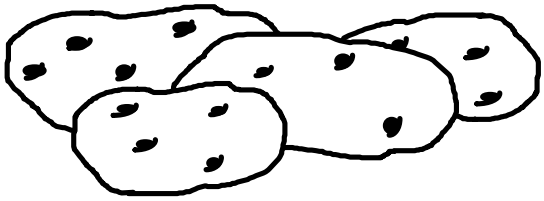
The question of the optimum seed rate to use was also raised at the meeting. In a seed rate trial done this past season at Aroostook Farm, we compared seed rates of three, six, nine, and twelve pounds per acre. There were no significant differences between the treatments. The three-pound seed rate yielded as well as any of the other seed rates. In this particular trial we had a good seedbed and good emergence. Under poor conditions, we might have seen a yield reduction at the three-pound seed rate if stands had been reduced. Literature recommendations are to plant from five to eight pounds per acre. The five-pound seed rate seems adequate from our experience this past season. Someone new to canola, or planting into less than ideal conditions, might want to increase the seed rate a bit closer to six pounds per acre. Growers who have grown canola and are confident they can get a good stand may want to decrease their seed rate to closer to four pounds per acre—but the lower the seed rate, the less room for error or mischance in obtaining a good stand. A couple of growers who broadcast seeded or just dropped the seed from the grain box of their drill were unhappy with distribution of the seed due to wind skips. Use drop tubes with the grain drill, but don't plant too deep—half an inch is sufficient.

Rotation effects

An issue of interest to everyone is the effect of canola as a rotation crop with potatoes. I think the jury is still out on this. However, initial results are encouraging. Research done by Tim Griffin and his colleagues at the Agricultural Research Service suggests that potatoes may show a benefit from a rotation that includes canola. None of the potato growers I have spoken to have seen any negative effects from canola. However, if we have a wet season where white mold is a problem, canola may not be helpful. Also, its long-term effects on soil organic matter remain to be seen.

Looking at it from another perspective, the herbicide most commonly used for potatoes in our region, metribuzin, is deadly to canola. There has only been one case of apparent herbicide carryover damage to canola in northern Maine that I am aware of. So while there is certainly potential for carryover, this is not a common problem. In general, fields with higher pH are more likely to have problems with carryover of metribuzin.

A grower interested in planting canola would be well advised to go forward with a limited acreage at first in order to limit risk. Once seeding and timing of harvest have been mastered then the canola acreage might be expanded.



CONTROLLING VOLUNTEER POTATOES IN ROTATION CROPS

John Jemison, Ph.D.
Water Quality and Soil Specialist

You may be thinking, "volunteer potatoes . . . don't worry—the Colorado potato beetles will take care of them." All I can

say for sure is that some years they don't, and last year was one of those. Fortunately, it was also a dry year and late blight didn't rear its ugly head. But there were enough volunteer potatoes in corn and small grain fields in central Maine to feed half the Roman army. Will this happen next year? It's hard to say for sure, but since the early part of the winter was particularly cool in central Maine, maybe not. Since volunteer potatoes have been a real problem two years out of the past three, let's go ahead and spend some time looking at the efficacy of a couple of new products out there that may help you keep this problem under control.

The traditional control measure for volunteer potatoes in corn has been use of a growth regulator such as 2,4-D or Banvel®, a tank mix of atrazine and dicamba (Marksman®) or intensive cultivation. However, a new product has been registered for use on corn that provides excellent control of volunteer potatoes. It is called Callisto™. From a production standpoint, it has a number of really useful characteristics: 1) it provides growers with a chemical that has an alternative mode of action; 2) it has a broad spectrum of activity on broadleaf weeds; and 3) it is effective on triazine-resistant weeds.

This past summer, we set up a study to do the following: evaluate this new product against some of the standard herbicide controls; determine the best combination of adjuvants and stickers to enhance efficiency of the material; and ascertain rates that maximize efficiency and minimize cost. The standard products we compared Callisto™ to were Banvel® and Marksman® applied at their full recommended rates. As for sticker and adjuvant products (those materials we add to postemergence herbicide applications to enhance activity and improve penetration of the leaf cuticle), we evaluated standard crop oil alone and with urea ammonium nitrate (UAN), as well as with and without atrazine. We also assessed whether or not the recommended rate would effectively control volunteer potatoes. Lastly we tried a couple of tank mix comparisons to see if Callisto™ was sufficiently effective on its own, or required the addition of Banvel® or Marksman® for successful control.

The treatments included in the study are as follows:

1)Check
2)Banvel® -16 oz/ac rate + nonionic surfactant (NIS) (0.25% v/v)
3)Banvel® + Atrazine – 16 oz/ac + 32 oz/ac + NIS (0.25% v/v)
4)Callisto™ - 3 oz + Crop Oil Concentrate (1% v/v) (COC)
5)Callisto™ - 3 oz + COC (1% v/v) + Urea ammonium nitrate (UAN) solution (2.5%)
6)Callisto™ - 3 oz + COC (1% v/v) + UAN (2.5% v/v) + 8 oz/ac atrazine
7)Callisto™ - 4.5 oz + COC (1% v/v) + UAN (2.5% v/v)
8)Callisto™ - 4.5 oz + COC (1% v/v) + UAN (2.5% v/v) + 8 oz/ac atrazine
9)Callisto™ - 6 oz + COC (1% v/v) + UAN (2.5% v/v)
10)Callisto™ - 3 oz/ac + Banvel (16 oz/ac) + NIS (0.25% v/v)
11)Callisto™ - 3 oz + Banvel and Atrazine (16 + 32 oz/ac) + NIS (0.25% v/v)

In doing the work, we were concerned about how effectively each treatment controlled volunteer potatoes, the extent of crop injury, and the potential to spread late blight. To assess these factors, ratings (1–10) were taken of crop and potato injury, and we counted the number of live, healthy, green potatoes remaining after spraying. We took these ratings 4, 10, and 21 days after application of treatments.

Results: Callisto™ more effectively controlled volunteer potatoes than either of the standard control treatments (*Table 1*). While Banvel® and Marksman® injured the potatoes, by the end of the evaluation period the volunteer potatoes that had been damaged by the treatments appeared to be recovering. This would again create the potential for crop yield reduction and the spread of late blight spores. Here are the data from the 10-day-after application evaluation:

Table 1. Herbicide Effect on Field Corn Injury and Volunteer Potato Control – 10 DAT

Treatment	**Corn Injury (% Injury)**	**Volunteer Potato (1–10 rating; 10 = healthy)**	**Number of Live Potatoes (number/288 ft^2)**
Check	0.0	8.8	70.5
Banvel®	0.0	6.8	31.0
Banvel® + atrazine	0.0	7.0	17.0
Callisto™ – 3 oz + COC	0.0	2.6	8.2
Callisto™ - 3 oz + UAN + COC	0.0	2.8	4.8
Callisto™ - 3 oz + COC + UAN + Atz	1.2	1.6	2.8
Callisto™ - 4.5 oz + COC + UAN	10.0	2.2	4.0
Callisto™ - 4.5 oz + COC + UAN + Atz	32.5	1.2	1.5
Callisto™ - 6 oz + COC + UAN	37.5	1.2	1.5
Callisto™ – 6.0 oz + COC + UAN + Atz	52.5	1.5	1.5
Callisto™ - 3 oz/ac + Banvel (16 oz/ac) + NIS	0.0	2.5	2.8
Callisto™ - 3 oz + Banvel® and atrazine + NIS	2.5	1.5	2.2
LSD @ 0.05	**9.8**	**1.0**	**12.8**

Crop injury was minor until the Callisto™ rate exceeded the recommended rate on the label. The addition of crop oil and UAN fertilizer increased the degree of crop injury. When we evaluated the tolerance of potato to the herbicides used, it was also apparent that Callisto™ was significantly more effective on volunteers than the standard herbicides. The combination of Callisto™ at 3 oz/ac with UAN and 8 oz/ac of atrazine was statistically similar to higher rate combinations and more expensive treatments.

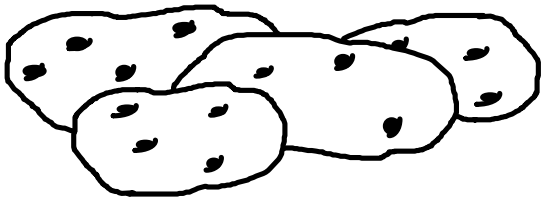
We also made a final rating at 21 days after application. The results were very similar to what we found at 10 days after application.

Table 2. Herbicide Effect on Field Corn Injury and VP Control – 21 DAT

Treatment	**Volunteer Potato (1–10 rating; 10 = healthy)**	**Number of Live Potatoes (number/288 ft^2)**
Check	8.5	68
Banvel®	7.6	28
Banvel® + atrazine	7.4	18
Callisto™ – 3 oz + COC	6.2	22
Callisto™ - 3 oz + UAN + COC	6.8	18
Callisto™ - 3 oz + COC + UAN + Atz	2.5	5
Callisto™ - 4.5 oz + COC + UAN	4.5	8
Callisto™ - 4.5 oz + COC + UAN + Atz	3.8	4
Callisto™ - 6 oz + COC + UAN	2.8	3.5
Callisto™ – 6.0 oz + COC + UAN + Atz	3.8	1.5
Callisto™ - 3 oz/ac + Banvel® (16 oz/ac) + NIS	4.2	9
Callisto™ - 3 oz + Banvel® and atrazine + NIS	3.8	6
LSD @ 0.05	**1.7**	**10.5**

Once again, Callisto™ applied at 3 oz/ac + UAN + atrazine was the most effective control treatment. The addition of a 1/2 lb/ac of atrazine seemed to significantly increase the effectiveness on the potato. However, if you want to plant a crop of potatoes in the same field next year, make sure that you do not spray atrazine after June 10 or you will not be in line with label regulations.

When one considers the potential damage that untreated volunteer potatoes can cause to you and your neighbors, taking the time to control this weed is extremely important. Next summer, we may be fortunate enough to not see this problem. But if we do, I hope these data will help you in your decision-making process.



STEVE JOHNSON APPROVED FOR SABBATICAL LEAVE

Steve Johnson has been granted a sabbatical leave for the period October 2003 to April 2004 to work with the Temuka Area Growers of New Zealand. The aim of the Temuka Area Growers is to improve the quality and productivity of the New Zealand french fry potato industry for the benefit of growers, processors, and consumers. The experience in New Zealand agriculture will broaden his expertise in both extension and potato production. Steve expects to use this as a growth experience, adapting what works well in New Zealand into current extension methods.

Major efforts during the proposed sabbatical leave are to investigate powdery scab and to refine the early blight forecasting system developed for Maine. The early blight forecasting system is a novel approach that optimizes the use pattern of new, extremely low risk group of early blight-specific fungicides. The hope is to be able to refine the prediction program after evaluating the approach.

Some of the harvesting equipment used in New Zealand is similar to that used in the U.S. and some is very different. Exposure to different equipment will allow Steve to bring back fresh ideas on bruise prevention and equipment modification to aid Maine potato growers. While previous anti-bruise efforts have made dramatic reductions, Maine potatoes have to much skinning, slight and serious bruise every year.

THE 2002 ANTI-BRUISE CAMPAIGN

Steven B. Johnson, Ph.D.
Crops Specialist

The Maine Potato Board again financed the Anti-Bruise Campaign for the 2002 harvest. Inspectors rated 530 tuber samples during September and October. Skinning injury and slight or serious bruise were evaluated by four inspectors working under the supervision of the Agricultural Bargaining Council. The Agricultural Bargaining Council also compiled data for the program. An additional inspector, under the direction of the Agricultural Bargaining Council rated 332 additional samples with an "electronic potato."

Bruise damage from the 2002 harvest was comparable to the previous year. The higher level of Ontario bruise-free potatoes during the 2002 harvest has reduced the bruise-related damage, especially the blackspot bruise that occurred in 1999 and 2000 with this variety. Table 1 lists bruise results from selected varieties. Samples from these seven varieties comprise 54 percent of the total samples. The complete report is available from both the Maine Potato Board and the Agricultural Bargaining Council.

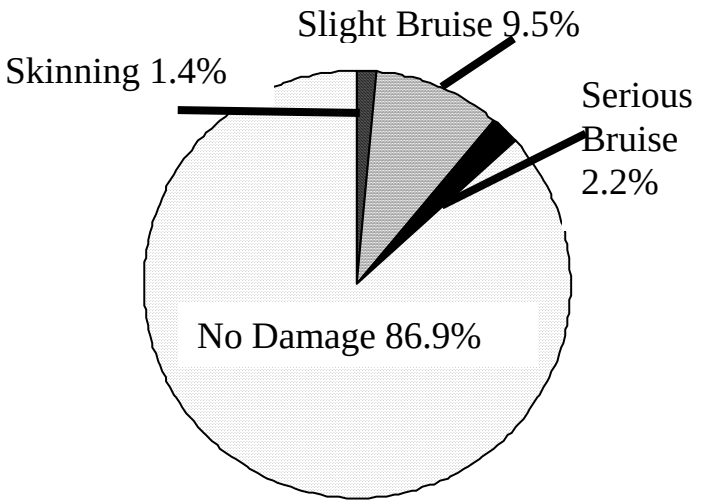


Table 1. Bruise Rating Selected Varieties from 2002 Harvest.

Variety	**Percent Bruise-Free**		
	2002	2001	2000
Norkotah	99	98	93
Shepody	95	91	95
Russet Burbank	94	95	88
Superior	87	93	91
Atlantic	94	86	89
FL1833	72	82	84
Ontario	97	96	72

Table 2. Bruise Ratings by Year.

Year	**Percent Skinning**	**Percent Slight**	**Percent Serious**	**Sample Number**
1994	7.6	5.2	8.4	606
1995	9.9	7.5	6.3	617
1996	2.2	4.9	4.8	519
1997	6.6	3.9	6.0	546
1998	3.5	3.8	2.2	569
1999	1.8	3.4	3.5	415
2000	10.7	4.3	5.8	653
2001	6.4	6.8	4.3	548
2002	1.4	9.5	2.2	530

SPUDLINES is published by the University of Maine Cooperative Extension to provide information for the Maine Potato Industry. The annual subscription rate is $5.00. The Educational Committee of the Maine Potato Board provides sponsorship of growers they represent and the allied industry needed to support their growers. For further information, contact: **Steven B. Johnson, UMCE, PO Box 727, Presque Isle, ME 04769; (207) 764-3361 or toll free in Maine 1-800-287-1462 or electronically at:**
sjohnson@umext.maine.edu

Meet Andrew Plant, Potato IPM Professional

Andrew Plant joined the University of Maine Cooperative Extension Potato Program in early June of 2002. Andrew will serve as the Potato Integrated Pest Management Professional, working alongside Crops specialist Jim Dwyer. His main responsibility is to oversee the Aroostook County portion of the Potato IPM program, but he will also assist in other Cooperative Extension projects and educational programs. Working as a summer IPM scout for three years, Andrew is no stranger to the program and has enjoyed his new role.

Andrew is a native of Aroostook County, graduating from Fort Fairfield High School in 1998. He recently graduated from The University of Maine in Orono where he received a Bachelor of Science in Biology. He is very happy to be back in “The County” and looks forward to pursuing graduate studies.

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