# SPUDLINES

**APRIL 2005** **SEED ISSUE**
**VOL. 43 NO. 2**

THE UNIVERSITY OF MAINE Cooperative Extension

**Dear Grower,**

**This is the Seed Issue of SpudLines for 2005. We hope that you will find the articles interesting and informative. As we approach this planting season, we strongly encourage growers to be monitoring soil temperatures in regards to planting potatoes. Please remember that potatoes do not grow below 45 degrees F, and fresh cut seed planted into cold soils may not suberize properly. Soil temperature information will be available by calling the "Hot Line" at 1-888-USE-UMCE (1-888-873-8623) or 760-9IPM (760-9476).**

**We, at Cooperative Extension, would like to congratulate Dr. David Lambert, Plant Pathologist at the University of Maine, for receiving the University of Maine Presidential Public Service Award. This award is well deserved.**

**All the best,**

**James Dwyer, Crops Specialist**

**Upcoming Programming of Interest - 2005**

| | |
|---|---|
| **July** | **Roguing School**<br>Cooperative Extension Office<br>Presque Isle |
| **July 17-21** | **Potato Association of America Annual Meeting**<br>Calgary |

**For further information, call 764-3361**

**For information on license credits, Call 760-9ipm 24 hours per day**

**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.**

## Maine Potato Board and Potatoes New Brunswick Form International Industry Working Group to Address Disease Issues Facing the Maine and Maritime Potato Growing Region

On November 19, 2004, Maine (USA) and New Brunswick (Canada) industry groups gathered for what would be the first of several meetings to plan a coordinated approach to potato disease management. The motivation behind these meetings was that potato late blight was present on both sides of the border during the 2004 growing season. The primary goal of the task force IMMPACT, which stands for International Maine Maritime Potato Action Team, was to establish cooperation and information sharing across the border on strategies to minimize late blight inoculum for the 2005 growing season.

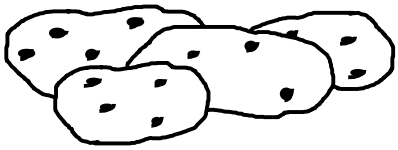
A plan of work was developed and implemented. Steps implemented included development of Web site materials, development of an information exchange process, and establishment of a New Brunswick weather station/late blight forecasting system compatible with the existing Maine system.

Growers and consultants on both sides of the border will hear a common message, and be kept updated on information such as seed selection, seed testing and handling, and cull pile management. Blightcast, a daily feature on WAGM television during the morning and evening weather forecast, will also keep growers informed about late blight conditions. Other media contacts from New Brunswick and Maine will be asked to help spread the message to industry stakeholders and to home gardeners.

"The creation of IMMPACT is long overdue," said Jean-Marie Pelletier, Chairman of Potatoes NB. "We have so much in common, and our crops are all threatened by the same pests and weather conditions that it only makes sense to work cooperatively."

"In a lot of places, Maine and New Brunswick are separated by a field road or a small piece of woods—it only makes sense to tackle pest problems as a region," said Donavan Todd, President of the Maine Potato Board.

If you would like any additional information please contact Timothy Hobbs of the Maine Potato Board at (207) 769-5061, or Robert Gareau of Potatoes New Brunswick at (506) 276-1822.



## Nitrogen Uptake By Potatoes in Maine: Implications for Rate of N Fertilizer Use

Peter Sexton, Extension Crops Specialist
Gregory Porter, Professor of Agronomy

Nitrogen is an extremely important element in crop production. It is needed in relatively large amounts, and agricultural soils do not generally provide adequate amounts of N unless supplemented with relatively high rates of N fertilizer. Potatoes are an example of a crop that requires significant amounts of N fertilizer. In trials done on-farm in 2002 and 2003 in Maine, 'Russet Burbank' potatoes took up an estimated average of 205 lbs of N per acre over the course of each season. After an initial lag period, the crop took up N in a linear manner from approximately 40 to 105 days after planting (Fig 1). Estimated average daily rate of N accumulation by the crop during this period was 2.9 lbs of N per acre per day in this particular study. Work done at the Aroostook Research Farm over several seasons showed total N uptake rates ranging from 140 to 160 lbs of N per acre for 'Atlantic' potatoes, and from 125 to more than 160 lbs of N per acre for 'Shepody' potatoes. Total uptake depends on the variety grown, the growing conditions, and the amount of nitrogen available to the crop. How long the plant is actively taking up N obviously has a large impact on how much N it needs. Shorter season varieties and early-harvested crops are going to demand less N than longer season varieties or late-harvested crops.

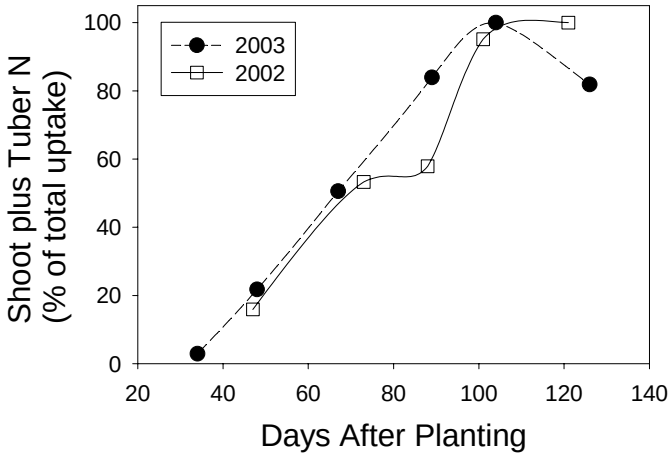



**Figure 1**. Uptake of nitrogen by 'Russet Burbank' potatoes grown near Fort Fairfield, Maine in 2002 and 2003. Nitrogen is plotted in percent of total uptake versus days after planting (DAP). Average daily uptake of N for these crops is estimated to be 2.9 lbs of N per acre per day in July and August in this study.

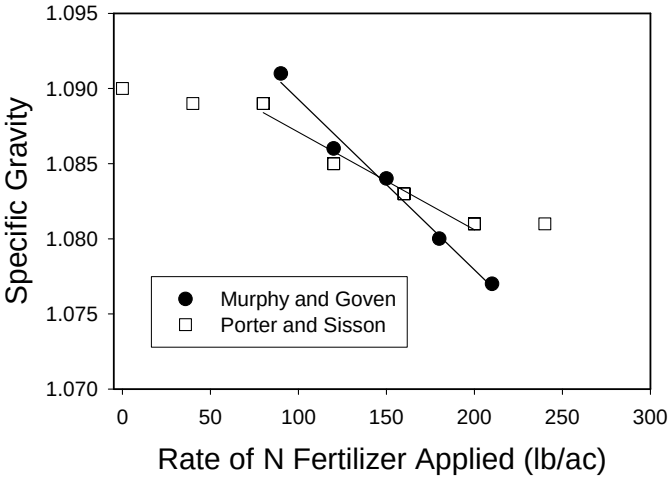



**Figure 2**. Average specific gravity of 'Russet Burbank' potatoes versus rate of applied N from trials conducted over several seasons in Maine. In these studies where N rates varied from 90 to 210 lbs per acre, for every additional 10 to 20 lbs of N applied, specific gravity decreased by 0.001 point. This data is taken from work conducted by Murphy and Goven (1959) (data interpreted from charts), and from work by Porter and Sisson (1991).

Application of excess N is costly in potato production, both in terms of fertilizer costs and in terms of lost quality for processing. As N rates are increased, specific gravity tends to decline - this has been known for many years (Fig. 2). The magnitude of the N rate effect on specific gravity varies among growing seasons and growing conditions; however, specific gravity almost always declines with increased rates of N application. The importance of this decline in specific gravity depends on the market that the potatoes are grown for and also on the growing conditions. In a growing season that results in relatively low specific gravity, the negative effects of excess N on specific gravity can result in a potato crop that has unacceptable specific gravity for processing markets. Excess N also makes vine desiccation more difficult, and it may make the crop more vulnerable to late-season late blight infection. Nitrogen fertilization tends to delay tuber bulking and maturity. This means that vines stay greener, and more susceptible to blight, later in the season. These negative effects (low specific gravity and difficult vine kill) are made even worse when late planting is combined with excess N. In other words, late-planted potatoes will be less forgiving of excess N application.

This raises the question of how much to decrease N rates when planting is delayed. For varieties that will use the full season, or that will be harvested green, if you are using high rates of N consider cutting back N rates by 10 pounds for every week that planting is delayed after May 18. This estimate is based on two factors. First, an actively growing potato crop takes up about 3 lbs of N per acre every day during July and August. Second, in terms of growing-degree-days, an average day in late May or early June is worth about half a day in July or August. So losing a week in late May means, on average, that the crop will lose about three to four days worth of growth in August. With the crop taking up about 3 lbs of N per acre per day in July and August, the loss of 3 or 4 days of growth means that N requirements would be 9 to 12 lbs lower. Thus the estimate of decreasing N rates by 10 lbs for each week of delayed planting. The grower who uses high rates of N needs to be extra careful to cut back on N rates when planting is delayed due to

inclimate weather as there will be less of a margin to work with before N rates become excessive.

For an earlier-maturing variety the situation is different. The growth lost due to late planting might be gained again by delaying vine desiccation and harvest in the fall. However, for a later-maturing variety the extra N will delay maturity and it is very risky to let the potatoes stay in the field longer given Maine's uncertain weather patterns. For processing potatoes, the combination of delayed maturity and risk of cold weather can cause quality to suffer.

Nitrogen is a dynamic element to deal with in managing soil fertility. It can be lost from heavy rainfall due to leaching, and it can be lost to the atmosphere to denitrification. On the other hand, decomposition of soil organic matter can make significant amounts of N available to a growing crop over the course of the season. Experimental work by Porter and others in Maine, and by Bernie Zebarth and colleagues in New Brunswick, has shown from 35 to more than 120 lbs per acre of N released (mineralized) from unfertilized check plots. Obviously, soil conditions, previous crop, and the amount and kind of organic materials added to the soil have large impacts on how much N is released during the growing season. Nitrogen mineralization is difficult to predict; tracking petiole nitrate-N or whole leaf N levels are useful tools to help evaluate N management decisions. Nitrogen rates recommended by the soil testing lab in Orono are shown in Table 1. Nitrogen rates reported in a survey of potato growers conducted in 2002 are shown in Table 2. In practice, growers tend to apply a little more N than is recommended by the University of Maine soil testing service, probably because of contract incentives for percentage of potatoes greater than 10 oz in size.

For processing potatoes where a large size profile is desired, with Russet Burbank our recommendation would be to consider 160 to 185 lbs per acre as a maximum rate for use after a grain crop that was not underseeded, and planted before May 18. A good rule of thumb would be to subtract 10 lbs per acre for every week the crop went in later than this. Credits for the previous crop should also be considered. Underseeded grain gives a credit of 10 lbs of N per acre based on University of Maine research, while typical green manure crops in a two-year rotation provide 20 to 30 lbs/A of N. If the potatoes follow a heavy, established stand of clover or alfalfa, research conducted at the University of Maine shows that a N credit of 40 lbs per acre is typical. For Shepody, a maximum rate of 150 to 165 lbs N per acre is a reasonable starting point for a full-season crop. Again, a good rule of thumb would be to subtract 10 lbs per acre for every week it goes in after May 18 and remember to figure in N credits for the previous crop (as mentioned above). Shepody grown for early harvest should receive 15 to 30 lbs/A less N fertilizer than a full-season Shepody crop.

Another caveat needs to be added here. Generally, the more organic matter a field has, the more N it will naturally provide (i.e. greater rate of N mineralization). So fields that are in longer rotations or have greater organic matter (e.g. from past manure applications or because of poor drainage) will generally need less N. If for your management system, you have found success with lower N rates than are mentioned above, then there is no reason to increase your rates to those listed above. Most likely the soil is providing the difference. On the other hand, if you are using N rates greater than what is suggested above, especially with later planting dates, you may be losing money by spending more on fertilizer than is needed, and increasing the risk of losing the crop to disease and/or poor quality.

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: **James Dwyer, UMCE, PO Box 727, Presque Isle, ME 04769; (207) 764-3361 or toll free in Maine 1-800-287-1462 or via e-mail at: jdwyer@umext.maine.edu**

**Table 1**. Recommended N rates (in pounds per acre) for potatoes grown in Maine, based on variety maturity, market, and previous crop. For early and mid-season varieties, the soils lab in Orono recommends subtracting or adding about 15 lbs of N for early or late harvest.

| Maturity | Market | After red clover or alfalfa | After grain under-seeded | After grain not under-seeded |
|---|---|---|---|---|
| early to mid-season | seed / process | 100 | 110 | 120 |
| early to mid-season | table | 110 | 130 | 140 |
| late season | seed / process | 110 | 140 | 150 |
| late season | table | 120 | 150 | 160 |
| Russet Burbank | seed / process | 120 | 150 | 160 |
| Russet Burbank | table | 130 | 160 | 170 |

**Table 2**. Average rates of N application (in pounds per acre) for growers who responded to a survey made in 2002. The number of growers who responded for each variety is shown in parenthesis after the variety name.

| **Variety** | **Average N Rate Used (lb/acre)** |
|---|---|
| Russet Burbank (16) | 180 |
| Superior (7) | 170 |
| Atlantic (5) | 160 |
| Reba (7) | 160 |
| Shepody (10) | 150 |

## Minimum Standards for Potato Seed Planting

Edwin R. Porter, Deputy Commissioner
Maine Department of Agriculture, Food and Rural Resources

The purpose of this article is to provide information on Maine's statute 951–A, relating to minimum standards for planting seed potatoes, and to outline this year's enforcement strategy.

The law became effective on January 1, 1981. The wording of the original law was vague and subject to interpretation, so it was amended in 1985.

The 1981 law implied, and the 1985 law stated, that any potatoes planted in fields of one acre or more in Maine must be certified. Potatoes imported from other states and provinces may be planted in Maine, providing they meet the minimum standards of Maine certified seed potatoes, including field inspection, winter evaluation, disease tolerances and grade requirements.

As a result of the minimum standards law, Maine has experienced a significant reduction in rejected seed acreage, and overall quality has improved in the tablestock and processing sectors.

With respect to enforcement of the statute, all commercial potato growers producing one or more acres must report their acreage, seed source, and certification number to the Department of Agriculture's Division of Quality Assurance and Regulations. Entry into the seed certification program does not exempt growers from this reporting requirement.

The Division of Quality Assurance and Regulations and the Division of Plant Industry will be cooperating on this year's minimum standards for planting efforts, including the review of reporting documents, seed certification, and the sale of local seed.

On or around **June 6,** a form and cover letter will be distributed to all producers who grew potatoes the previous year. On or around **July 7**, a certified letter will be sent to growers who failed to respond to the initial mailing, informing them of the need to

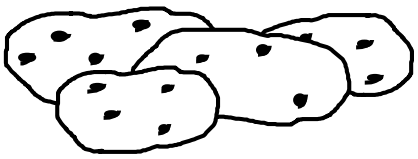
report and the consequences for failing to do so. The violation for failing to report is a civil penalty ranging from $200–$1,000 and ensures an automatic audit of the grower's records (see below).

To ensure compliance with the statute, a random audit of growers' records is conducted annually. The level of audit is currently set at 20 percent of Maine's potato growers. The audit entails a farm visit to inspect bills of sale, cancelled checks, and other evidence, which supports the information provided on the report form. Failure to submit to the audit is a separate civil penalty of between $200–$1,000, and failure to supply the required paperwork carries another separate civil penalty of between $200–$1,000.

If, through the audit process, a grower is found to be in violation of the minimum standards statute, he/she will be fined between $20–$100 per acre for each acre in violation.

We realize that because of disease, weather, and the economic conditions that have plagued potato growers for the past several years, it may be tempting to cut corners and not plant certified seed this year. However, the industry cannot afford to compromise the gains made in upgrading the image of the industry by planting noncertified seed. Therefore, the Department of Agriculture will be enforcing the statute and initiating appropriate legal action against those who are in violation or who fail to report as required.

Thank you for your anticipated cooperation as we work to maintain the high quality image of the Maine potato industry.



**Hairy Nightshade: Implications for Potatoes**

Andrew B. Plant
Extension Potato IPM Professional

Hairy nightshade, *Solanum sarrachoides,* is the most widespread of the five nightshade species in North America. It is a common weed of disturbed habitats such as roadsides, rights-of-way, grazed rangeland, flower beds, vegetable gardens, and cultivated fields. Its occurrence in Aroostook County, however, has been infrequent. The nightshades are of concern in grain crops due to growth and harvest interference, and in livestock grazing because of the potential toxicity of high alkaloid concentrations in the seeds. Although not of primary concern, the presence of nightshade presents some dangers to potato, *Solanum tuberosum,* as well.

Hairy nightshade is an annual weed species, surviving only one season. The appearance of hairy nightshade is similar to that of potato and tomato. Leaves are alternate and egg-shaped, and stems are generally light green, and round to angular in shape. Both leaves and stems are distinctly covered in glandular hairs. Flowers of the hairy nightshade are white, with five petals. Propagation results from the production of true seed that can be dispersed by rodents, birds, livestock, and mechanical disturbance (e.g. typical farming practices such as spraying, cultivation, and tillage). Seed is typically light to dark green even when mature. This weed can produce an immense amount of seed: references cite several thousand seeds per plant. Hairy nightshade germinates throughout the growing season at temperatures of 66ºF to 102ºF. Optimum germination temperatures are between 80ºF and 91ºF. Germination is also greatly affected by soil moisture: germination decreases significantly as soils become drier. Hairy nightshade is well adapted to a broad range of pH levels, from pH 4 to pH 9. Maximum emergence of this weed occurs at about 2 cm below the soil surface and decreases to its limit of approximately 8 cm below the soil line.

Hairy nightshade was noted in the Aroostook County region during the 2004 potato production season. The weed was a weak competitor, as substantial populations only occurred within the 6 to 12 feet of cultivated headlands outside of potato fields. The incidence of hairy nightshade was not noted within any potato fields surveyed, and

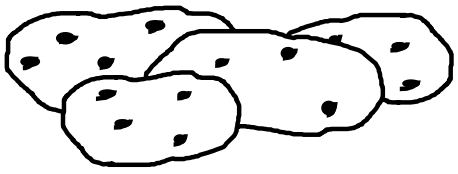
incidence dramatically decreased as the distance from the field edge increased, possibly due to competition from other weed species.

The consequences of hairy nightshade occurrence in our potato production area are not typical of most weeds. Most of the weeds common to our production area are controlled on the basis of resource competition, in that the weeds are competing with potatoes for nutrients, water, sunlight, etc. Hairy nightshade, however, presents its greatest threat to potato production in its close relation to potato (genus: *Solanum*), because it can successfully harbor many of the same insect and disease pests that potato does. The occurrence of potato late blight, potato virus Y, potato virus A, potato leaf-roll virus, and the secondary hosting of green peach aphid and Colorado potato beetle have all been documented on hairy nightshade.

Potato late blight, *Phytophthora infestans*, was detected on hairy nightshade at several fields in our potato production area in the 2004 cropping season. Two independent USDA-ARS resources verified that the isolates occurring on both hairy nightshade and potato in these fields were of the A2 mating type and US-8 clonal lineage. Hairy nightshade, therefore, poses a threat as a potential source of inoculum for late blight. There are several scenarios in which hairy nightshade could be a key component in late-blight spread. Fields in rotation may harbor this weed and may act as intermediate infection points and inoculum sources for adjacent potato fields. Headlands of potato fields are typically disturbed through tillage and cultivation and are compatible areas for hairy nightshade to emerge and propagate with little competition. These headlands may receive little or no application of late blight fungicides, since they are not part of potato production areas. This could lead to a situation in which there is late-blight-susceptible foliage, provided by the hairy nightshade, directly adjacent to a potato field. We suspect that hairy nightshade, being an annual, does not present a risk as an overwintering source for potato late blight inoculum.

Management of hairy nightshade has been difficult, since it germinates over an extended period of time. Its typical late emergence, occurring after weed control measures have been completed and results in dramatic increases in its seed bank. Selection of herbicides for use with specific rotation crops may also be implicated in population increases of this weed. Herbicides selected for broadleaf rotation crops such as canola and broccoli may have fair to poor efficacy against hairy nightshade, allowing for seed bank buildup. Pre-emergence applications of herbicides labeled for potato have shown only fair control of hairy nightshade. Post-emergence applications have generally yielded better results. Cultural practices such as tillage and cultivation may affect hairy nightshade germination and seed production. Comparisons of mold board and chisel plowing indicate that seed densities of this annual weed increase more rapidly with chisel plowing than with mold board plowing. This is due to chisel plowing's effect of moving the weed seed table closer to the soil line. Mechanical control of emerged hairy nightshade in the headlands of potato fields may be accomplished by disking or mowing. Mowing may help prevent seed production by reducing the seed bank. Disking does the same but has the added benefit of killing and burying the live tissue that serves as an infection source for potato late blight.

The extent of density and distribution of hairy nightshade in this growing region is as yet unknown. We will pay close attention to this pest in the coming 2005 cropping season. Producers and consultants should keep abreast of this situation. Please feel free to contact University of Maine Extension personnel with questions or comments.



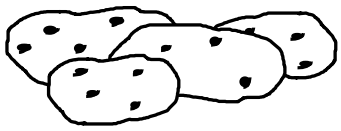
**Fusarium Head Blight**
**Planting Precautions for Cereal Crops**

Matt Williams, Extension Educator

Weather-related problems occurred in our cereal crops in both Maine and the Canadian Maritimes last growing season, as well as the year before. One of those problems was a relatively high level of fusarium head blight (FHB), commonly known as scab. This fungus can and did result in the development of a mycotoxin known as deoxynivalenol (DON), or vomitoxin.

Like late blight in potatoes, FHB must have the combined requirement of inoculum and weather conditions to occur. Warm, wet, and rainy weather at flowering leads us into FHB. Fortunately, these combined factors are rare in our climate; but they can and did occur, and no doubt will again, but hopefully not often. In the long run, resistant varieties are the goal to eliminate the economic threshold problems that are being encountered in the major grain growing regions. Development of these varieties is out of our control; but when options become available, we should move to them. Cultural control relies on crop rotation, with a potato rotation being very favorable due to the tillage practices. Crop residues that resist rapid breakdown have been shown to allow fusarium to grow and develop spores, which are blown onto the heads and develop when conditions are favorable. Corn is one such residue, and FHB problems have become more prevalent where corn is grown.

FHB results in shrunken kernels; so in many cases, it can be reduced with proper cleaning. More often than not, the affected kernels are blown out behind the combine. The levels of DON detected this year indicate that some level of affected kernels will exist in the seed to be planted this spring. This seed has little to no potential to produce FHB in the field, but can pose a threat to plant stands. Fortunately, seed treatment with products such as thiram, vitavax, or vitaflo have effectively prevented plant-stand loss. Growers should insist on clean and treated seed, and avoid planting back uncleaned seed, especially if it is low test weight.



**How Safe is That "Farmer's Tan"?**

Darcy Walsh
Community Health Educator
The Aroostook Medical Center

***Skin cancer may be another occupational hazard for farmers.*** The nature of farm work involves spending many working hours outdoors, and often in direct sunlight. Avoidance of the sun by farmers is nearly impossible; therefore, it is important for farm workers to take extra steps to reduce the risk of skin cancer. Skin cancer is the most common form of cancer. The American Cancer Society estimates that there are more than one million cases of skin cancer in the United States each year. Research has shown that overexposure to sunlight, especially when it results in sunburn, is a major factor in the development of skin cancer.

***What is skin cancer?*** Skin cancer is a disease in which cancer (malignant) cells are found in the outer layers of your skin. Most skin cancers are classified as *nonmelanoma*. Nonmelanoma skin cancer usually occurs in the cells that are located at the base of the outer layer of the skin. Most nonmelanoma skin cancers develop on sun-exposed areas of the body, like the face, neck, lips, and back of the hands. In *melanoma* skin cancer, the cancer cells are found in the cells that color the skin (melanocytes). Melanoma is a more serious type of cancer. People who burn easily, freckle, or have a fair complexion experience greater changes, and are at higher risk, for developing skin cancer.

***Signs and Symptoms of Skin Cancer***

- Any change on the skin. This could include changes in the size or color of a mole.
- Scaliness, oozing, bleeding, or change in appearance of a bump or nodule.
- The spread of pigmentation beyond its border, such as dark coloring that spreads past the edge of a mole or mark.
- A change in sensation, itchiness, tenderness, or pain.

***What Farmers Can Do***

Promote sun safety on the farm with the following practices:

***Sunscreen:***

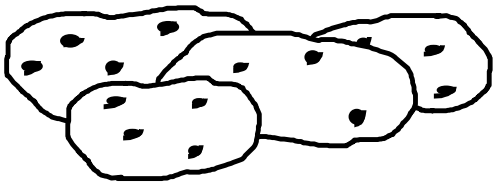
Farm workers should protect themselves from skin cancer by applying sunscreen year-round. Sunscreens recommended for outdoor workers should have an SPF rating of at least 15.

***Sunglasses:***
Farm workers should also wear sunglasses with 99–100 percent UV absorption to protect their eyes from sun exposure.

***Clothing:***
Wear lightweight clothing to cover up your skin. The thought of wearing long-sleeved shirts and long pants in the summer might sound unbearable, but proper clothing can help protect against extreme sunlight.

***Avoidance:***
The easiest way to reduce overexposure to ultraviolet radiation is to avoid the sun, especially between the hours of 10 a.m. and 3 p.m. For farmers, avoidance may be difficult, but seeking shaded areas and wearing a hat will be most beneficial. A wide-brimmed hat is recommended, but a baseball hat is better than nothing. Apply sunscreen to the tops of the ears for better protection!

**Remember:**
- Use sunscreen (SPF 15 or higher).
- Wear a wide-brimmed hat.
- Wear sunglasses.
- Seek shade.



- Cover up.

## Planning Your Own Farm IPM Program

James Dwyer, Extension Crops Specialist

As we look towards the summer of 2005, potato growers should plan an extremely rigorous IPM approach to late blight management. Preplanning for the 2005 crop season is extremely important. The potential for potato late blight is significantly greater in 2005 than it was in 2004. Therefore, all growers and industry members will have to work together in order to manage this risk.

In your planning process, please do not intentionally increase your risk—or your neighbors' risk—of late blight. Please plant only certified, late-blight tested seed. To do anything else will put your operation and your neighbors' operations at extreme risk. Using high-quality, late-blight tested seed is a vital component of your IPM strategy for 2005.

Another important component of your IPM strategy for 2005 will be to follow the weather and the development of the late-blight severity value information. This information will be available via WAGM television, the Pest Alert newsletter, our "Hot Line" at 1-888-USE-UMCE or 207-760-9IPM, or MainepotatoIPM.com on the Internet. These sites will provide you with the most up-to-date late blight information available for our area. Knowing what is going on is a major part of an effective IPM program.

Understanding the disease will help you employ as many integrated control strategies as possible. Encourage your neighbors to be as informed as you are. Information is a power tool in managing this threat.

SCOUT! Once 18 severity values have been achieved, undertake rigorous field scouting. Scouting for late blight is an art form. It takes practice to spot the disease early. The earlier the disease is found within a field, the more control options the grower has.

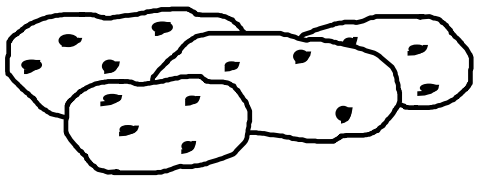
Traditionally, low areas where fog tends to hang are excellent locations to look for potato late blight. But if late blight is being blown in from some distance, long distance low inoculum dispersal, knolls and behind tree lines are also excellent areas to examine.*

If you plant samples that you are unsure of during the season, please do not assume. Have the samples identified.

If late blight is found on your farm, please be a courteous neighbor and let your neighbors know that late blight has been found. You would want your neighbor to let you know. This is a community disease and it takes the community working together to manage this disease effectively.

A well-planned on-farm and community IPM approach to preventing and managing potato late blight will be extremely important to a successful 2005 crop season.

*This would also be an excellent reminder to check and recheck rock piles, cull disposal areas, and rotation fields for volunteer growth. Management of volunteers will be critical for effective late blight control.



**Handling and Planting Seed Tubers**
**Part 2: Cutting and Planting**

Steven B. Johnson
Extension Crops Specialist

**Precutting, Holding, and Handling**

Once you select good seed, you must decide if precutting the seed is appropriate. Precutting seed potatoes involves warming the tubers, cutting them to size, and cooling the seed pieces back down to a

holding temperature. Not all seed potatoes should be precut.

Only precut seed exhibiting young or middle physiological age, since precutting advances the age of the seed. Seed that is physiologically young can be precut up to one month before planting. If the seed has previously sprouted, the seed should be cut only two weeks ahead. Middle-aged seed can be precut up to two weeks ahead of planting only if it has not sprouted. Middle-aged seed that has sprouted and been desprouted should be considered old seed. Do not precut seed that is physiologically old. Physiologically old seed should only be cut a few days ahead of actual planting. Cutting any earlier may cause additional aging and advance the seed into producing “potato no top.”

The age of the seed determines the temperature to which to warm the seed and to hold the cut seed. The younger the seed, the higher the cutting and holding temperatures. Young seed can be cut and held at about 50°F, whereas older seed should not be warmed or held above 45°F. Since sprouting adds additional physiological age to the tuber, the temperatures should be lower for seed that has sprouted previously.

To help potato seed overcome adverse soil conditions at planting, and to avoid dormancy factors in some varieties, precutting seed offers several advantages. Precutting seed potatoes advances the physiological age of the tubers. Precut potatoes may have a better opportunity to cure under controlled storage conditions. Also, precutting allows the cutting operation to begin before planting starts, when labor is less in demand. Properly cured cut seed, if held for three or four weeks, will overcome dormancy factors and provide more uniform sprout development. Precut seed will provide earlier emergence, vigorous early growth and higher plant and stem populations. Varieties that have slow seed curing ability, such as Atlantic and Kennebec, are good candidates for precutting.

Delayed emergence, slow, uneven establishment, and reduced plant stands are all symptoms of planting seed into soil that may be either too cold, too wet, or even too dry. Freshly cut seed planted

into these unfavorable conditions often fails to heal properly; it becomes dehydrated or infected by disease organisms and is not capable of productive growth. Erratic and slow plant development also interferes with timely herbicide and hilling practices, and missing hills and smaller plant canopies later in the season offers less competition to weeds.

Follow the prescribed temperatures and timing determined by the physiological age carefully. Keep

in mind that the cutting, warming, and holding will all advance the physiological age of the seed. As mentioned, precutting is not for all seed. Planting fresh-cut seed is recommended with seed that requires immediate planting.

Once you have selected good seed and decided to cut, proper seed cutting and handling are essential. Properly cut seed pieces feed correctly in the planter and provide uniform plant stands. Mechanical cutters can handle large volumes of seed and cut tubers into two, four, or more pieces. Hand-cutting minimizes the number of blind pieces, but is slow and labor intensive.

Potatoes should be warmed before they are cut. If cool tubers are brought into warm, moist conditions, condensate can form on the tubers. This is to be avoided. Do not wash seed tubers. Do not try to salvage diseased potatoes or those that are breaking down. Grade out bent or very rough tubers for hand-cutting. Size the seed tubers before cutting. Tubers under 1.5 oz should not be planted. Tubers weighing over 1.5 oz but less than three oz should be planted whole. Cut three- to five-oz seed tubers into two pieces. Cut five- to seven-oz tubers into three pieces. Sort out seed over 10 oz for cutting by hand, or preferably, for sale to other markets.

Disinfest all equipment before each seed-cutting session and between seed lots. This reduces the spread of pathogens between seed lots. Should a seed lot show excessive amounts of disease, discontinue cutting and disinfest the seed cutter. At this time, determine whether the problem is throughout the entire load of potatoes or just a pocket in the load. If, at any time, you discover or suspect ring rot disease, cease all cutting operations.

The entire facility, including the handling equipment, should be cleaned and disinfested. It is imperative to have a laboratory diagnosis of the suspect potatoes; discontinue the use of the suspect seed lot until the diagnosis is complete. Do not use the seed lot if it is positive for the ring rot pathogen.

Seed cutters are not complex pieces of machinery, but they do need regular maintenance and adjustment. Calibrate the seed cutter daily and between lots. The cutter may have to be readjusted with a variety change. Varieties with poor eye distribution (e.g. Shepody, Atlantic) should be cut to a larger seed-piece size than varieties with a more even eye distribution. Typically the flow of the seed tubers has a lot to do with the quality of the cut seed. Too many tubers too fast result in a quick seed cut, but not a quality cutting job.

Keep the seed cutter knives sharp and straight to prevent ripping the potato surface. Ripping provides an ideal area for disease organisms to attack the seed. Read the seed cutter manual for proper maintenance and adjustment.

The size of a potato seed piece is a very important factor affecting early plant vigor. Larger seed pieces usually emerge faster than smaller ones. Cut seed tubers into blocky pieces ranging from 1.5 oz to two oz. Seed pieces should average slightly larger, at 2 to 2.5 oz for Russet Burbank and similar varieties, with larger spacing between seed pieces. Do not use seed pieces smaller than 1.5 oz. Seed pieces larger than three oz may have some difficulty feeding through a planter. The narrower the seed-size distribution, the better the planter operates. A rule of thumb would be 60 to 70 percent between 1.5 and 3 oz. No more than 10 percent should be less than one oz or more than 2.5 oz. Discard poorly cut seed pieces, such as slivers or slabs. Remove seed pieces ripped or torn by dull knives. Each seed piece should have at least one eye. For varieties with poor eye distribution, such as Atlantic and Shepody, consider cutting seed pieces closer to two ounces each. Undersized seed pieces can contribute significantly to the number of doubles or triples planted. Oversized seed pieces can cause skips, and are also prone to falling out of the planting mechanism prematurely.

If you are hand cutting, demonstrate the proper seed sizes and shapes to your cutters. Measurement accurately establishes the size distribution and profile of the cut seed. If there are 100 seed pieces in 10 lb, the average size is 1.6 oz; if there are 91 seed pieces, the average size is 1.75 oz; if there are 80 seed pieces, the average size is two oz. If you would rather count out 100 seed pieces and weigh them, 9.4 lb would have an average size of 1.5 oz, 10.9 lb would have an average size of 1.75 oz, and 12.5 lb would have an average size of 2 oz.

containers, should be free of pesticide or fertilizer residues. Pesticides, especially herbicides, on seed potatoes can adversely affect seed potato



Avoid extensive exposure of the cut seed to sun or wind. Tarping transport trucks is recommended. The trucks, as well as other handling or storage

SPUDLINES

1865 THE UNIVERSITY OF MAINE Cooperative Extension

Presque Isle, Maine 04769
Return Service Requested

Nonprofit Org
US Postage
PAID
Presque, Isle, Maine
Permit No. 125