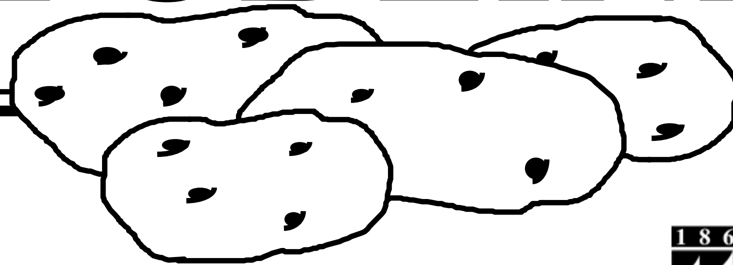
SPUDLINES



MARCH 2003 **SEED ISSUE**
VOL. 41 NO. 1

THE UNIVERSITY OF MAINE Cooperative Extension

Dear Potato Grower,

This is the first issue of SPUDLINES for 2003 with another issue scheduled in April/May. In this issue, articles are presented on the seed and seed handling. I want to put in a push for Maine seed. The virus levels are some of the lowest that have ever been seen. This and the risk of importing late blight or worse,, should make buying Maine seed an easy choice. Peter Sexton reports on a survey he performed. Distribution of fact sheets developed by UMCE staff continues with the IPM fact sheet: FIELD SCOUTING A TOOL FOR POTATO PEST MANAGEMENT

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

March Tuesdays	**Agriculture Winter School** Houlton High School, Houlton

For further information, call 764-3361

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BACTERIAL WILT

Steven B. Johnson, Ph.D.
Crops Specialist

The nature of concern over bacterial wilt has recently changed with the occurrence of *Ralstonia solanacearum* race 3 biovar 2. While races and biovars of *Ralstonia solanacearum* cause bacterial wilt diseases, *Ralstonia solanacearum* race 3 biovar 2 is a newly detected, serious pathogen that could affect many vital agricultural crops. This pathogen is listed on USDA's Agricultural Bioterrorism Act of 2002 Select Agents and Toxins List. This pathogen presents a particular threat because it can survive in colder environments where potato seed is produced. *Ralstonia solanacearum* can infect and be distributed in geranium cuttings. In fact, this has occurred. Four commercial greenhouses in Illinois, Indiana and

Wisconsin have been quarantined by APHIS, as well as the original shipper in Kenya. Time will tell where all the infected cuttings were distributed.

History

Bacterial wilt, also known as brown rot or southern bacterial wilt, affects potatoes in almost every warm, semitropical, and tropical area of the world. It has also been reported in relatively cool climates. This disease is the limiting factor in potatoes and other crops in many parts of the world.

Causal Organism

Bacterial wilt is caused by *Ralstonia solanacearum* (*Pseudomonas solanacearum* E. F. Smith), a gram-negative rod-shaped bacterium. Optimal growth of most strains occurs at 86–90 ^{o}F; however race 3 biovar 2 grows relatively well at lower temperatures and poses a real threat. *Ralstonia solanacearum* survives better in wetter soils than dry soils. Races of *Ralstonia solanacearum* differing in host range have been described. A race pathogenic to potatoes is weakly virulent on tobacco but avirulent on banana; the banana strain is avirulent on potato. In contrast, tobacco and tomato strains are typically virulent on potato.

Symptoms

Symptoms of bacterial wilt include wilting, stunting, and yellowing of the foliage and eventually death. Symptoms may appear at any stage of potato growth. Wilting may be severe in young plants of highly susceptible varieties. Often, one branch in a hill may show wilting. With rapid disease development, all stems in a hill may wilt quickly. This can occur without much change in leaf color. Wilted leaves fade to a pale green and may turn brown as they dry. Infected vascular strands in young potato stems can sometimes be seen as dark narrow streaks visible through the stem epidermis. Bacterial-wilt-affected plants can have glistening beads of dark gray slimy ooze on the infected xylem in stem cross sections. Bacterial streaming of fine milky white strands from xylem vessels occurs when stems are cut and placed in water. The streaming, easily visible with a naked eye, is composed of masses of bacteria in extracellular slime.

On the tubers, grayish brown discoloration, usually evident through the tuber periderm, indicates well-established infection. Tubers from infected plants may or many not show symptoms; cross sections usually show distinct grayish brown vascular discoloration that may extend into the pith or cortex from the xylem tissue. When infected tubers are cut in half and light pressure is applied, grayish-white droplets of bacterial slime ooze out of the vascular ring. The eyes, often at the bud or apical end, become grayish brown, and a sticky exudate may form on them or at the stolen connection. The bacterial ooze mixes with the soil, causing soil particles to adhere to the tuber surface. An infected tuber left in the ground continues to decay; secondary organisms break it down.

Disease Cycle

In tropical and semitropical regions the pathogen can be borne by tubers. Infected seed potatoes are an important factor in the distribution and increasing severity of the disease.

Temperature plays an important role in the geographic distribution of the organism, which is rare where mean soil temperatures are below 59 ^{o}F. In North America, seed potatoes are grown in the temperate regions where *R. solanacearum* does not occur, and tuber transmission is not a problem. High temperatures favor growth of the pathogen and development of the disease in the field.

The disease occurs in soil types ranging from sandy to heavy clay and over a wide range of soil pH. Disease usually develops in localized areas often associated with poor drainage. On newly cleared forestland, bacterial wilt may be severe if a susceptible crop is planted.

Control

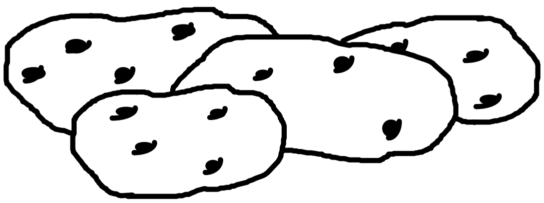
Crop rotation with nonhost species is one means of control of *R. solanacearum*. However, *R. solanacearum* has more than one race and has a host range exceeding 150 plant species in over 33 different plant families. The most susceptible hosts are in the Solanaceae family. Other important economic hosts of *R. solanacearum* include tobacco, tomato, pepper, peanut and banana. Many hosts of *R. solanacearum* are weeds. The population of *R. solanacearum* increases in soil where susceptible hosts are grown and decreases where bare soil is maintained weed free. *Ralstonia solanacearum* has been reported to survive in soils planted to nonhosts. This is influenced by soil type and the choice of nonhost. Roots of asymptomatic or nonhost plants can support saprophytic growth of *R. solanacearum*, possibly in root exudates or as localized or systemic infections. The ability to survive in association with nonhosts can, at times, undermine the effectiveness of crop rotation in reducing the pathogen population in the soil.

Species of plants differ greatly in their ability to support populations of *R. solanacearum* in the soil. Nonhosts, such as sweet potato or corn, and resistant varieties, have been shown to reduce the levels of the pathogen in the soil. Bean (*Phaseolus vulgaris*) has been reported as a host for the pathogen. These, and possibly other leguminous species, should be avoided as rotational crops where bacterial wilt has occurred. Graminaceaous plants have not been reported as hosts for *R. solanacearum*, so these would be good choices for rotational crops in fields infested with the pathogen. There is a gradual decline of the pathogen population with nonhost crops, but the decline is slower than that of weed-free, bare soil. There is an increase in the population of *R. solanacearum* where susceptible plants are grown in the presence of the bacterium.

Some crop rotation sequences reduce disease severity; they may act indirectly by reducing populations of root-knot nematodes that enhance infection by *R. solanacearum* on potato.

There are resistant potato clones available, although the environmental conditions can affect the expression of the disease on these resistant clones. Some potato varieties show more tolerance than others to bacterial wilt. Always use disease-free tubers. Disinfect seed cutting equipment on a regular basis, and frequently whenever a suspect lot is being handled.

Ralstonia solanacearum race 3 biovar 2 could become one of the most devastating pathogens to the potato-seed-producing areas of the US in memory. It is indeed a threat that needs to be monitored.



USE OF POLYACRYLAMIDE AS A SOIL CONDITIONS FOR AGRICULTURAL SOILS

Laurie Osher, Ph.D.
Plant, Soil and Environmental Sciences

Introduction: During the past several decades, mean summer temperatures have increased around the globe. This temperature increase has lead to a change in rainfall distribution in many agricultural regions. In recent years, drought has caused serious crop losses throughout much of North America, including Maine. With an increased likelihood of drought in Maine's potato production region, we need to identify management practices that increase water availability and reduce water stress.

A soil conditioner is any material that is added to a soil for the purposes of improving its physical condition. Polyacrylamide (PAM) is a soil conditioner synthesized from natural gas in an industrial process. In agricultural regions of the western US, PAM additions to soil have maximized rainfall penetration and decreased erosion.

The University of Maine’s Dr. Laurie Osher is reviewing research addressing PAM in agricultural systems, both as an additive to irrigated fields and as an amendment for nonirrigated fields. Her report will be available from the Maine Agricultural and Forest Experiment Station in summer 2003. Dr. Osher is also researching the potential benefits of using PAM on Maine’s soils. This work is being done as a bench scale study and should be completed by May of 2003. The Maine Potato Board and the Maine Agricultural and Forest Experiment Station are supporting this work. Here is a brief overview for those of you interested in learning more about the use of PAM as a soil conditioner.

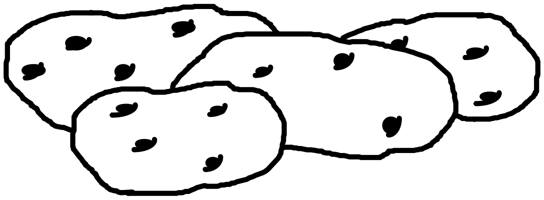
Methods of Application: PAM can be applied to the soil dissolved in irrigation water (for furrow, sprinkler and spray irrigation) or mixed with water and applied by high-pressure sprayer application. It can also be applied dry and then tilled into the soil. In Maine, furrow irrigation is uncommon; thus the most likely application methods are sprinkler irrigation (for irrigated fields) and high-pressure sprayers (for nonirrigated fields).

Physical Effects: PAM functions very well as a soil conditioner. PAM acts as a strengthening agent, binding soil particles together by chemically bonding with the clay (charged) portion of the soil, or by forming a bridge between larger soil particles and aggregates. Much like root exudates, PAM helps connect soil particles and thus improves soil aggregation. By increasing soil cohesion and aggregate strength, surface sealing is reduced. Water infiltration rate and permeability increase. As water penetration increases, the amount and rate of runoff and soil erosion decrease. All of these attributes ensure that more rainwater and irrigation water will reach the crop.

Effects on Crop Yield: While increases in crop yield, more rapid germination and earlier seedling emergence were observed for a range of nonpotato crops from cotton to lettuce, PAM additions did not result in significant increases in potato grade or yield. However, potatoes were more easily harvested in soils amended with PAM. And for farmers that use irrigation, PAM applications reduced the volume of irrigation water needed to maintain crop yields.

Form: Polyacrylamide is a synthetic organic compound composed of many linked carbon chain subunits (monomers), some of which are acrylamides, meaning they have an amide (NH_2) group attached. PAM can be formulated as anionic (negatively charged), cationic (positively charged), or nonionic (noncharged). Replacing some of the amide functional groups with differently charged compounds changes the overall charge of the PAM being synthesized. Anionic PAM is the most common form of PAM used in agriculture. It has been found to be most effective in very high molecular weight ranges, greater than 15 million g/mole. Nonionic and cationic PAMs are rarely used for agricultural purposes.

Degradation and Toxicity: Degradation of PAM in the soil is caused by biological, chemical and physical breakdown. PAM degradation rates are estimated to be approximately 10% a year. It is assumed to degrade into propianic acid, which hydrolyzes into propianamide, which in turn breaks down to carbon dioxide, water and ammonia. There is a possibility that degradation of PAM molecules liberates individual acrylamide monomers. Acrylamide is a neurotoxin. Because of the potential for soil and water quality contamination with acrylamide, there are strict limits on the percentage of acrylamide monomer in PAM formulations. The maximum acceptable concentration of acrylamide in PAM products used in the US is 0.05%. Europe permits only 0.025 % acrylamide monomer in PAM products.

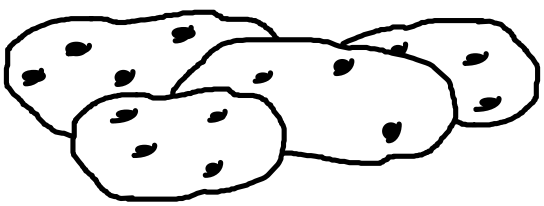


SEED PROMOTION EFFORTS CONTINUE

Steven B. Johnson, Ph.D.
Crops Specialist

The Maine Potato Board continued its seed promotion efforts in marketing the 2002 seed crop. Seed growers Kyle Blackstone, Kendall Shaw, Brent Buck and David Bartlett, as well as Don Flannery and Steve Johnson 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 and Powdery Scab to growers. Don Flannery gave a growing season review and promoted the high quality of Maine seed to the audience. Field and storage 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 to North Carolina, seed growers Kyle Blackstone Steve Whited, and Andy McGlinn, as well Tim Hobbs and Steve Johnson 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 and Powdery Scab to about forty-five growers and industry attendees. 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.



2002 SURVEY OF POTATO GROWERS

Peter Sexton, Ph.D.
Crops specialist

Last spring a survey of Maine potato growers was conducted to help prioritize efforts to address agronomic problems associated with potato production. Two hundred surveys were sent out to growers randomly selected from the *Spudlines* mailing list. Twenty-nine growers responded to the survey: eleven processing, five seed, four chipstock, one tablestock, and eight mixed-production growers. A portion of the survey is summarized below.

Farmers were asked to rank agronomic problems in order of importance. These were ranked on a 1 to 10 scale (1 being most important and 10 being least important). Average rankings are as follows (the lower the number, the more important the problem):

Soil Fertility	2.0
Stand Establishment	4.2
Plant Population	4.4
Bruising/Skinning	4.7
Soil Erosion	4.9
Tuber Size	5.5
Weed Control	5.6
Vine Killing	6.1
Tillage	6.2
Irrigation	6.5

Soil fertility was ranked as the area needing the most work or improvement. Focusing on this, average reported fertilizer application rates for the five most commonly listed potato varieties, and for oats and barley, were as follows:

Variety	**N**	**P**	**K**
Russet Burbank	180	170	210
Shepody	150	160	190
Superior	170	150	220
Atlantic	160	140	170
Reba	160	150	180
Oats	45	6	13
Barley	55	15	30

Growers indicated that the bulk of their N, P, and K were applied at planting. Topdress applications of N were made by 18% of the growers, with about 26% of their N being supplied that way, on average. Potassium was broadcast ahead of planting (either in the fall or spring) by 8% of the growers who delivered about 50% of their K in that manner. Another 10% of growers topdressed 40% of their K after planting, on average.

The most complete information on micronutrient use was reported for 'Russet Burbank' potato. Boron was applied by 64% of the 'Russet Burbank' growers—with 29% applying at planting, 11% applying preemergence, and 25% applying foliar. Zinc was applied by 54% of the 'Russet Burbank' growers—with 29% applying it at planting, 11% preemergence, and 14% of the growers making a foliar application of zinc. The average rate for boron application over the season was 0.35 lb (this includes split applications). The rate for zinc application varied widely with a median rate of 3.5 lb per acre when applied at planting or before emergence.

The top seven weeds were listed in order of concern by farmers as follows:

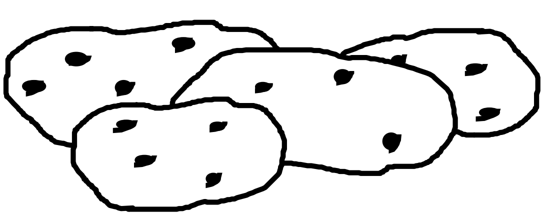
Lambsquarter
Pigweed
Mustard
Barnyard Grass
Chamomile
Volunteer Cereals
Quackgrass

Metribuzin was used by over 80% of the growers. Rimsulfuron and linuron were used by 20–30% of the growers. Most of the growers who used rimsulfuron also used metribuzin. Pendimethalin and metolachlor were used by less than 10% of the growers.

About half the growers indicated that they used a growth regulator or similar product on at least a portion of their farm.

We also asked growers what format they liked to see information presented in. Newsletters were rated as "good" avenues for delivering information. Fact sheets and conferences were rated as "fair" means of communication. Internet and TV/radio broadcasts were rated as "fair" to "poor" channels of communication.

I would like to extend a word of thanks to all those who took the time to respond to the survey. More information was gained than what was presented here. While it is a bit tedious at times, this kind of survey helps guide our work. Research looking at rates and times of nutrient application, weed control, and other areas, is ongoing. We hope to present this information in future newsletters and fact sheets.



TARNISHED PLANT BUG IN POTATOES

James D. Dwyer
Crops Specialist

The tarnished plant bug is a small insect that is commonly found in area potato, hay and broccoli fields. The immature form of this insect can easily be mistaken for other potato pests if not properly identified. The adult form of this insect is about 1/4-inch long, dark brown to pale green with reddish-brown, black and yellow markings. Most specimens show a rusty appearance that is the basis for the name "tarnished." The nymph or immature form is a greenish color and goes through a series of five molts before becoming an adult. The nymph stage of this insect has the potential to be misidentified as potato leafhopper.

Tarnished plant bugs have piercing sucking mouth parts and feed on plant juices from foliage, soft stems and fruits of many plants such as strawberries, wild mustard, goldenrod and vegetable crops, including broccoli and potatoes.

On potatoes, the tarnished plant bug feeds on the blossoms and new growth. Many times a small brown spot can be seen at the base of the blossom where the insect has fed. At the feeding site, plant tissue can die, causing premature blossom drop and, if on new growth, a browning of leaflets. In fact, when feeding is heavy some new top growth may even look burned as the tissue supporting the leaflets dies.

In northern areas such as Maine these insects overwinter as adults. Activity begins in the spring as these adults emerge and feed on blossoms and buds. Eggs are laid on the petioles and stems of host plants. Hatching occurs in approximately 7 days. The hatched nymphs go through a series of five molts before becoming adults, which takes about 30 days.

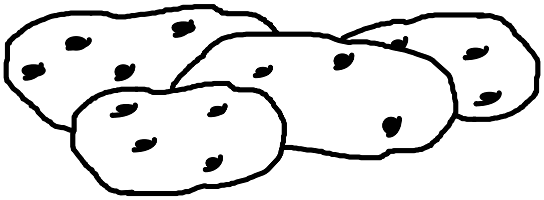
Tarnished plant bug populations in potatoes rarely rise to levels that warrant control measures. When control measures are required, many of the same materials once used to control Colorado potato beetles will control tarnished plant bugs. Please consult the current pest control guide (http://www.mainepotatopestguide.com/). Clean cultivation helps manage this pest.

Potato fields that border clover or grass fields will tend to have higher populations. An edge effect in the bordering broccoli or potato field will also be likely; the rows closest to the grass or clover field will have higher populations. As you move into the field, the population will drop, producing a classic "edge effect." If the grass or clover field is mowed, the tarnished plant bugs will probably move into the potato field, again producing an edge effect, which can be revealed through field scouting. On rare occasions this scenario can produce create localized populations that may warrant intervention.

AN ECONOMIC ANALYSIS OF ROTATION CROPS IN THE MAINE POTATO CROPPING SYSTEM

John M. Halloran
USDA-ARS

Six rotation sequences were analyzed to determine their impact on farm profitability and income risk. The rotations were potato–potato, barley–potato, sweet corn–potato, green beans–potato, soybean–potato, and canola–potato. Enterprise budgets for all crops were developed to determine production costs. Using historical yield, price data and the enterprise budgets, economic simulations were run to determine the average return to management and marketing efforts as well as the impact on income variability for each rotation sequence. Based on a two-year rotation sequence, the potato–potato rotation outperformed all sequences except sweet corn and green beans with respect to average return. However, in terms of income variability the potato–potato rotation carried the highest level of risk.



HANDLING POTATO SEED FOR OPTIMAL PERFORMANCE

Steven B. Johnson, Ph.D.
Crops Specialist

Selection of good seed is a critical decision faced by every potato grower. A good crop starts with good seed. The same amount of fertilizer, pesticide, and effort is put into a crop from poor seed as into a crop from good seed. Selection of seed that is both physiologically and physically healthy is important. Disease-free seed is essential to a good crop. Seed that is physiologically young, has been handled gently and stored carefully is also important.

Choose Disease-Free Seed

Inspect seed for disease symptoms. Some disease symptoms can be treated, but the presence of others should be grounds to reject the seed. If more than 20 small or 10 large *Rhizoctonia* sclerotia are visible on one side of the seed tuber, consider using a different seed source. Seed with less than 20 small or 10 large sclerotia should be treated before use. Seed lots with less than 0.5% of tubers with *Fusarium* symptoms can be used if the diseased tubers are removed before cutting, and seed treatments are used on the remainder of the lot. Tubers with 5% or more of the surface affected with silver scurf should not be used for seed. Seed lots with more than 1% of the tubers showing blackleg symptoms or soft rot symptoms should not be used. The presence of pinkeye, early blight or late blight lesions on the tubers could act as inoculum for new crop infection. This seed should not be used. Know the source and history of a seed lot and try to avoid those that had heavy infection with *Verticillium* spp. Seed-borne scab can contaminate a field without a history of scab and should be used only in fields with a history of scab. High levels of scab on the seed warrant rejection of the seed lot.

Generally, a 5% rule applies with seed lots, meaning a seed lot with 5% or more total defects is too contaminated to use. Seed is a large investment and each grower should strive to use the highest quality seed obtainable.

Physiological Age of Seed

The physiological age of seed is an important consideration in potato seed selection and cutting. Factors affecting the physiological age of tubers include growing season stress, storage temperature and time. Temperature is very important because warmer storage temperatures will speed the aging process of the tubers. Since precutting seed also increases its physiological age, an understanding of the stages of aging is necessary.

Dormant seed: If the potatoes do not sprout at all, they may still be in a period of dormancy. Most potatoes undergo a dormant or resting period. The length of dormancy varies with the variety.

Young seed: Young seed is characterized by apical dominance. Young seed will have one or just a few sprouts. These sprouts emerge from eyes on the apical or bud end of the tuber. Young seed will produce a plant with few stems. A low stem number leads to a low tuber set. Larger but fewer tubers would be expected from young seed.

Middle-aged seed: Middle-aged seed will have multiple sprouts. All the eyes on the potato could sprout. Middle-aged seed produces plants with multiple stems that lead to high tuber sets.

Old seed: Old seed will have branched sprouts that can appear hairy. These sprouts are weak, and they will not produce a vigorous plant. Typically, plants from old seed will produce high tuber sets, but the plants lack the vigor to bulk the tubers to a desirable size. Seed can be so old that small tubers form on the sprouts once they emerge from the eyes. "Potato no top" is the name given to this disorder of extremely old seed. Seed that produces a potato no top symptom should not be used.

Cutting Seed Pieces

Once good seed has been selected and the decision to cut has been properly made, proper seed cutting and handling is essential. Properly cut seed pieces feed correctly in the planter and provide uniform plant stands.

Potatoes should be warmed prior to cutting. Seed tubers should not be washed. Do not try to salvage diseased potatoes or those that are breaking down. Grade out bent or very rough tubers for hand cutting. Size seed potatoes before cutting. Tubers under 1.5 oz should not be planted. Tubers weighing between 1.5 and 3 oz should be planted whole. Cut 3- to 5-oz seed tubers into 2 pieces. Cut 5- to 7-oz tubers into three pieces. Sort out seed over 10 oz for cutting by hand, or preferably for sale to other markets. Disinfect all equipment before each seed cutting session and between seed lots. Calibrate the seed cutter daily and between lots. 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.

Proper Seed-Piece Size

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 about 1.75 oz in size. 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 2 oz each.

An ideal seed size range is between 1.5 oz and 2 oz. For 'Russet Burbank' and similar varieties, seed pieces should average slightly larger at 2 to 2.5 oz, with larger spacing between seed pieces. Seed pieces smaller than 1.5 oz should not be used. Seed pieces larger than 3 oz may not feed easily through a planter. Planters require a minimum of 70% of the seed to be in the 1.5- to 3-oz range.

Higher total yields are generally associated with larger seed pieces, but there is a point at which increasing the seed piece size will not result in increased yield. Bruise problems are more severe with very large seed pieces. Excess bruising increases the risk of seed decay problems. There is a greater cut surface area per seed piece with large seed. More stored energy will be used for wound healing and less is left to support new plant growth. Emergence will likely be slowed and plants will be less vigorous. Try to keep the number of cut surfaces per tuber to a minimum.

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 fall out of the planting mechanism prematurely.

In order to know how well your seed cutting operation is doing, you need to know the weight distribution of your seed. No more than 10% should be less than 1 oz or more than 2.5 oz. 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 2 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.

Seed Treatments

Chemical seed treatment is often used as insurance against disease. Chemical seed treatment is recommended if seed is to be planted in very wet, very dry, or very cold soils. Seed-piece treatments with a ground tree bark component appear to aid in wound healing and help prevent cut pieces from sticking together. This provides for better flow of seed at planting. There is excess material remaining when 1 lb of seed treatment material is used per 100 lb of cut seed, and coverage may be inadequate with 0.5 lb of material per 100 lb of cut seed.

Handling Cut Seed

Care in handling cut potato seed is perhaps the most underrated consideration in commercial potato production. Cut potato seed is much more easily bruised than whole potatoes of similar weights. The most vulnerable areas of the seed pieces are the edges of the cut surfaces. Very small impacts are sufficient to damage cells on the edges of the cut seed. These damaged areas allow decay organisms present on the seed or in the soil an opportunity to infect the seed piece. Damaged cells may not heal.

Seed-tuber and seed-piece bruise is beginning to be recognized for its importance. Bruise problems are more severe (both before and after cutting) with larger seed tuber sizes. As seed tuber size increases, there are more cut surfaces, more right angle cuts, and greater cut surface areas per seed piece. The number of cut surfaces on the seed piece affects the rate of emergence, the rate of early growth, stem numbers, set, grade and final yield. The more cut surface area on the seed piece, the greater the seed decay potential, the slower the emergence, the more stored energy in the seed that is dedicated to wound healing and suberization and, therefore, the less that is left to support new plant growth.

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:**

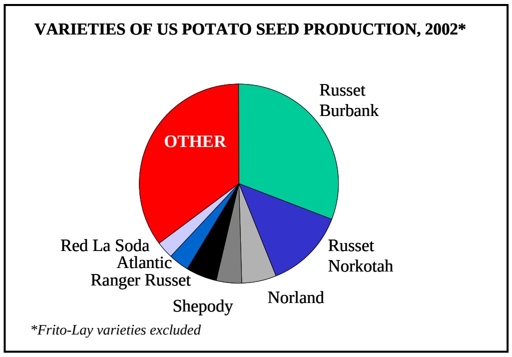
sjohnson@umext.maine.edu

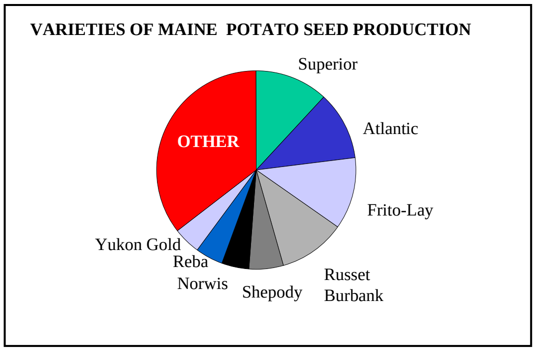
SEED POTATO PRODUCTION IN THE UNITED STATES

Steven B. Johnson, Ph.D.
Crops Specialist

There were 141,645 acres of potato seed entered for certification in the United States during the 2002 growing season. Maine is the fourth leading state in the country for seed acreage. The eight leading states account for over 90 percent of U.S. seed acreage.

As expected, the acreage of seed for processing potatoes dominates the national production. The variety *Superior* is the leading seed acreage in Maine. In fact, Maine produces 67 percent of the nation's acreage for this variety.





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