



Marketing Maine Tablestock Potatoes

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Contents

Executive Summary

This publication is a broad overview of the marketing environment for Maine potatoes and is designed to help Maine's fresh potato producers better evaluate their handling, packaging, transportation, and distribution options, and improve the profitability of their operations. The idea for the project emerged from a USDA, Agricultural Research Service analysis that concluded that the Maine tablestock (fresh) potato sector is particularly deserving of targeted marketing assistance.

To assess the competitiveness of Maine potatoes, this report briefly examines the production and marketing of potatoes in Maine, Canada, and in the Western United States. It is based on quantitative information gathered by market news reporters with the USDA, Agricultural Marketing Service's Fruit and Vegetable Division and on anecdotal information obtained through interviews with retail and wholesale potato buyers. It describes in detail the marketing entities through which growers sell fresh potatoes, including regional marketing cooperatives and collective acreage/production limit schemes. Various potato promotion and branding campaigns are also examined, including the promotion of such highly differentiated potato items as heritage potatoes, "eco" (sustainably produced) potatoes, and organically produced potatoes.

The authors discuss *category management*, how it is used by potato marketers in other parts of the country to fulfill the needs of retailers, and how Maine potato growers might benefit from the practice. Currently, Maine's producer coordination is insufficient for category management.

Energy and fuel costs influence transportation options for Maine potato producers. Unfortunately, energy costs in Maine are higher than the average in the United States and well above those in other potato-growing areas. Moreover, although escalating fuel costs make local sources of potatoes increasingly attractive, Maine's current transportation infrastructure—especially its railroads—limits its ability to deliver potatoes economically. Western producers typically use rail to reduce transportation costs, negating Maine's geographical advantage. The potato industry in Maine should consider ways to upgrade the State's transportation system with improved rail service to compete with Western States.

Quality, sizing, grading, and postharvest handling are also addressed in this report, along with suggestions for improving current practices. High-quality potatoes require a high-quality production system, including appropriate postharvest, grading, handling, and storage equipment and facilities, and proper quality control to prepare potatoes for market.

Background

The Marketing Services Division of USDA's Agricultural Marketing Service (AMS) was asked by USDA's Agricultural Research Service (ARS) National Program Leader and ARS's New England Soil and Water Research Laboratory personnel to help with existing efforts to assist Maine fresh potato farmers in their search for alternative marketing strategies, and reverse the recent decline in the profitability of their operations. ARS researchers previously had conducted an exhaustive study defining possible crop rotations for potatoes to maintain soil fertility, reduce pest infestation, and preserve crop yields. In the course of the investigation, they determined that Maine producers needed help in marketing their products and turned to AMS for expertise in marketing and distribution practices. As a result, AMS's Marketing Services Division initiated a study to evaluate the Maine potato industry and identify changes in business planning, product aggregation and handling, grower organization, distribution practices, and marketing activities that might help Maine's fresh potato growers.

In order to more fully understand the Maine potato marketing situation, AMS and ARS staff interviewed people involved in the potato industry. In January 2007, they contacted Maine Potato Board members and staff and scheduled a meeting with the board. Also at that time, AMS and ARS staff met with the Maine Commissioner of Agriculture and the USDA State Farm Service Agency (FSA) Director who helped them understand the financial situation of Maine tablestock potato producers.

Beginning in June 2007, AMS researchers arranged on-site meetings with wholesalers and market news reporters in Jessup, MD, and Boston, MA, and with several potato farm operators in northern Maine. This was followed in 2008 by interviews and conference calls with chain store buyers in Virginia and Washington, DC; Cooperative Extension educators in Maine; potato brokers; AMS Market News staff in Benton Harbor, MI, and Boston; and USDA Federal inspectors. To better learn how Maine's fresh potato producers could best penetrate the markets for "sustainable," "local," and "eco-labeled" foods, they met with the management and staffs of Red Tomato, Whole Foods Market, and Appalachian Sustainable Development, retailers on the forefront of developing direct supply chains for locally grown food. To understand the different potato products marketed to consumers, AMS researchers conducted informal surveys of retail merchandising practices for Maine-origin and other potatoes at chain store outlets.

AMS researchers also undertook several supplemental analyses to identify Maine's relative competitiveness with other sources of supply in major market locations. Prices of Maine fresh potatoes were compared with those of potatoes from other production areas from AMS Market News data. The costs of rail, truck, and water transportation for Maine and other fresh potatoes to major market locations were also examined using waybill data, to understand the transportation burden faced by Maine's fresh potato producers. The cost of energy and Maine's position in the competitive world of electricity, fuel, and natural gas supply and rates were compared with other producing areas to highlight the challenges Maine faces.

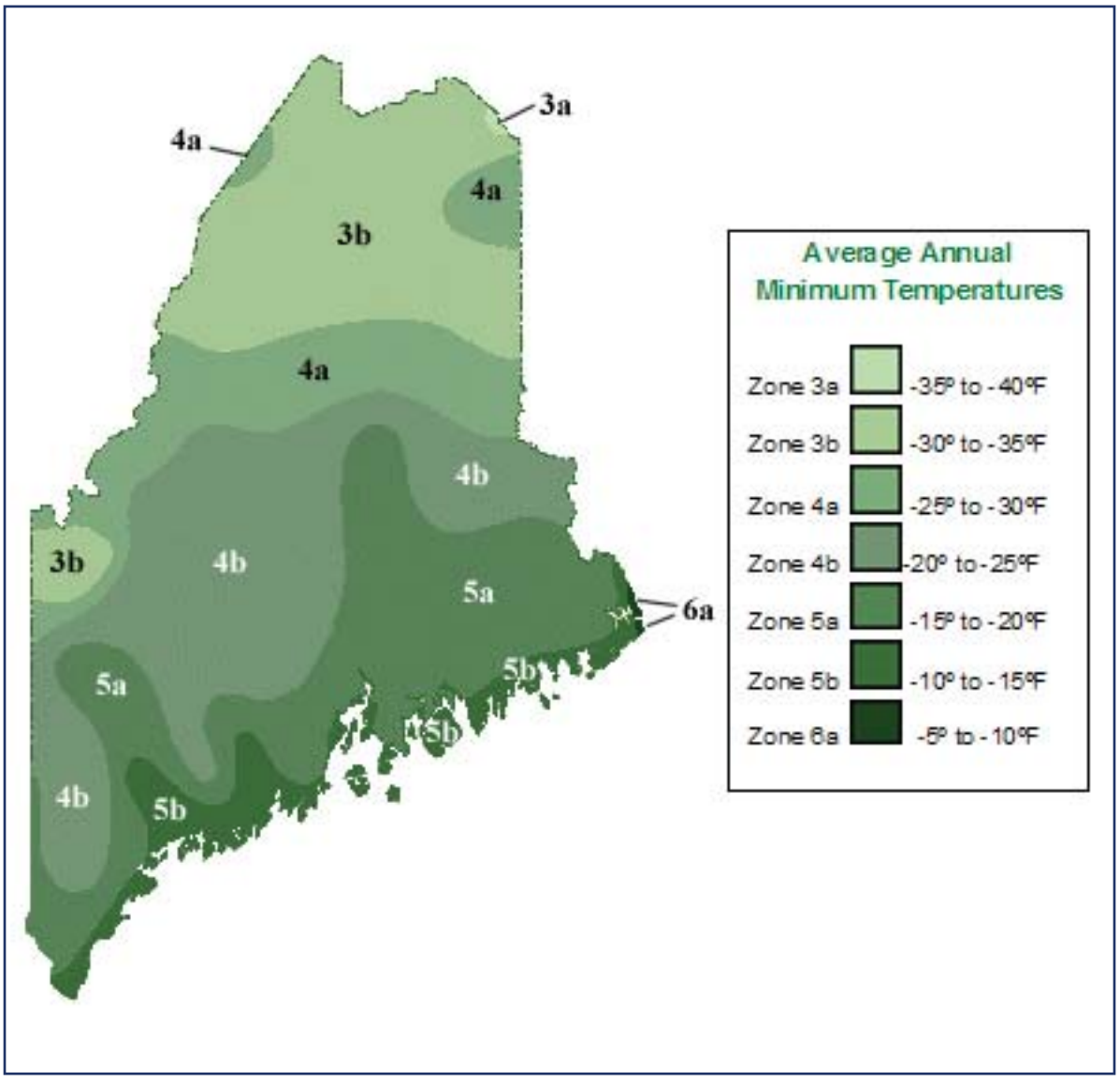
The report also examines how fresh potato growers, repackers, and marketers in other parts of the country use cooperative marketing and supply control mechanisms, category management, and branding/promotional programs to enhance marketing efficiency and performance, and how channel diversification into processed market items, such as dehydrated products, starch, and plastics can help support fresh potato growers by creating alternative outlets for grade 2 and cull potatoes.

Introduction

Potatoes are grown in several areas of Maine, but production is centered in the far north of the State, in sparsely populated Aroostook County. The growers in more southern Maine are able to sell to nearby population centers and use more direct marketing, roadside stands, and farmers markets, and engage in more diversified production because those markets are available.

Farmers in Aroostook County are not only farther from markets, but also have a shorter growing season and a colder and harsher climate (figure 1). They have fewer choices in crops, but are fortunate to have access to one of the larger agricultural production areas remaining in the eastern United States.

Figure 1. Plant Hardiness Zone Map of Maine[1]



1 Mark L. Kramer, Weather Mark LLC

After preliminary discussions with the Maine Commissioner of Agriculture, members of the Maine Potato Board, the Agricultural Bargaining Council, the USDA State FSA Director, and representatives from the University of Maine's Cooperative Extension Service, three important facts came to light, setting the tone for the work that followed:

1. Potato farmers, particularly tablestock producers, were in a poor financial position; with little credit and few funds to invest, they were risk-averse.
2. Potato farmers generally preferred those alternative crops that did not interfere with potato production as their primary crop. Farmers who became serious about alternative crops often quit growing potatoes.
3. Tablestock potato production had always been an important income source for Maine farmers; it was difficult to imagine a healthy Maine farming industry without it.

We wanted answers to these questions about the importance of tablestock production to Maine agriculture:

- What will happen if potato processors lower prices, decrease the volume of contracts, or cut out growers for some other reason?
- How will growers deal with rising transportation costs reducing their already thin margins?
- What leverage would farmers have if the processors control all the markets for potatoes?

In considering those questions, it appeared that a viable tablestock industry was one important way to balance the market power of potato processors and assure the financial health of all industry participants.

It also appeared that without a healthy potato farming industry in Maine, there was little need to identify other potentially profitable crops to grow in rotation with potatoes. So in the end, we decided to examine the Maine tablestock industry and see what could improve that market.

After meeting with State officials, the USDA Farm Service Agency, and the Potato Board, several farmers were visited at their farms. There was a sharp contrast between growers that were producing potatoes for processing (largely profitable and interested in expanding their operations), those growing seed potatoes (somewhat concerned about declining sales), and growers of tablestock potatoes (very concerned with declining sales and low prices). All the farmers, regardless of their specialization, agreed on the importance of creating additional markets for tablestock potatoes as well as the urgent need for a market for lower grade potatoes.

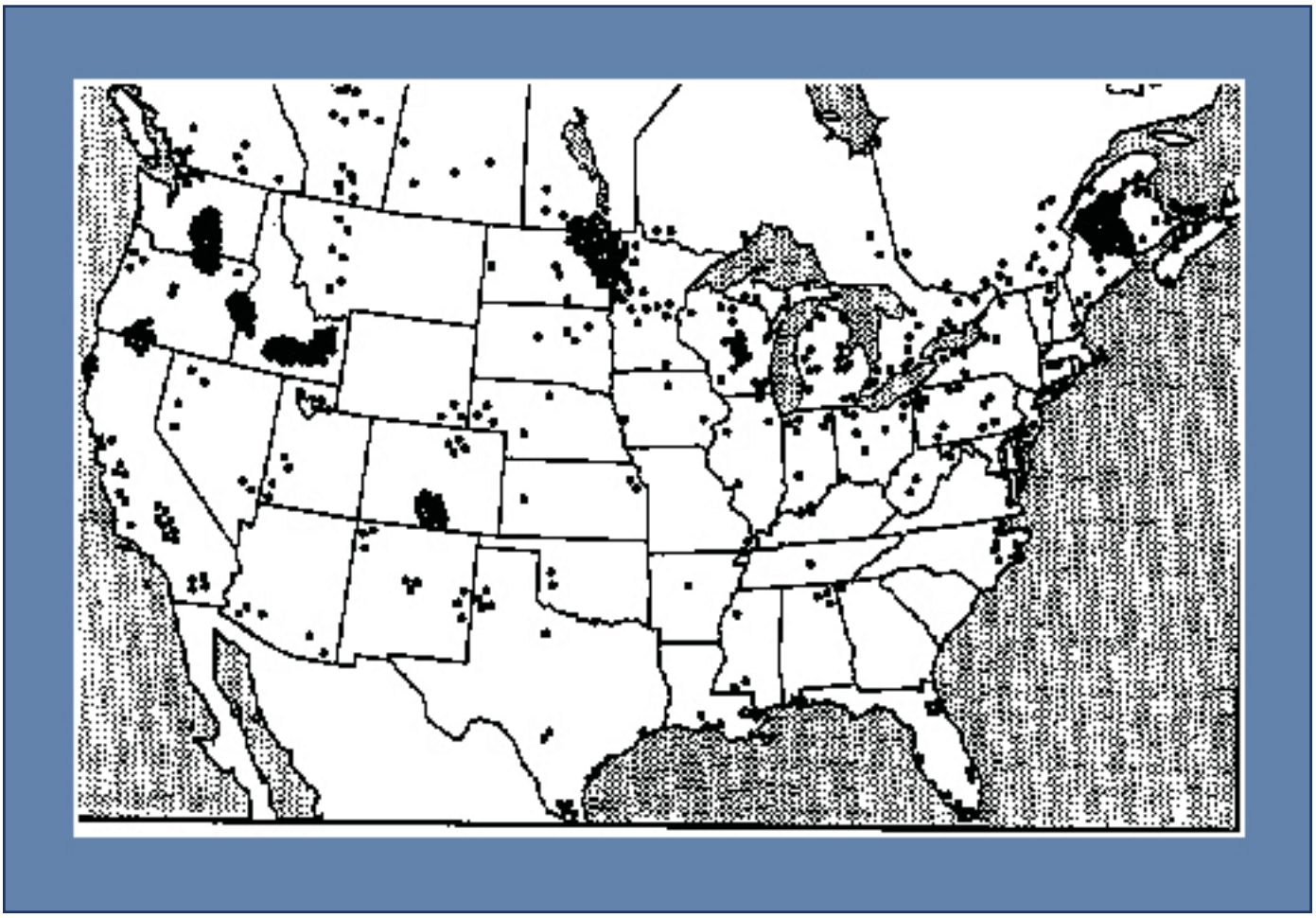
AMS, ARS, and USDA Rural Development personnel talked to tablestock producers about the need for unified or joint marketing. Consolidation in the food industry means fewer but larger potato buyers. Growers in other States (and Canadian Provinces) have responded to market trends by combining forces so they could serve large customers adequately, but Maine tablestock producers did not adopt unified marketing strategies as quickly. Lacking the ability to leverage their production volume through cooperative marketing strategies, Maine growers are left with smaller segments of the fresh potato market.

Farmers also noted that buyer acceptance of tablestock potatoes from Maine may also be somewhat undermined by past dissatisfaction with the quality of the packout. Maine was later than some production areas to institute potato washing. Some farmers, faced with a dismal market for number two grade potatoes, may also have packed some lower graded potatoes as number ones. To alleviate concerns that tablestock potatoes from Maine's growers and handlers were lower in quality than those from other States, Maine instituted a potato grade size slightly larger than the U.S. grade standard for products shipped outside the State. Wholesalers, retailers, and repackers gave generally positive responses when asked about the reputation of Maine potatoes, especially the larger "Chef's" potatoes sold primarily to restaurants.

Overview of the U.S. Potato Industry

As shown in figure 2, potatoes are grown in most U.S. States and many Canadian Provinces, with production concentrated in the Pacific Northwest, the Upper Great Plains, and Maine.

Figure 2. Principal potato producing regions in the United States and Canada



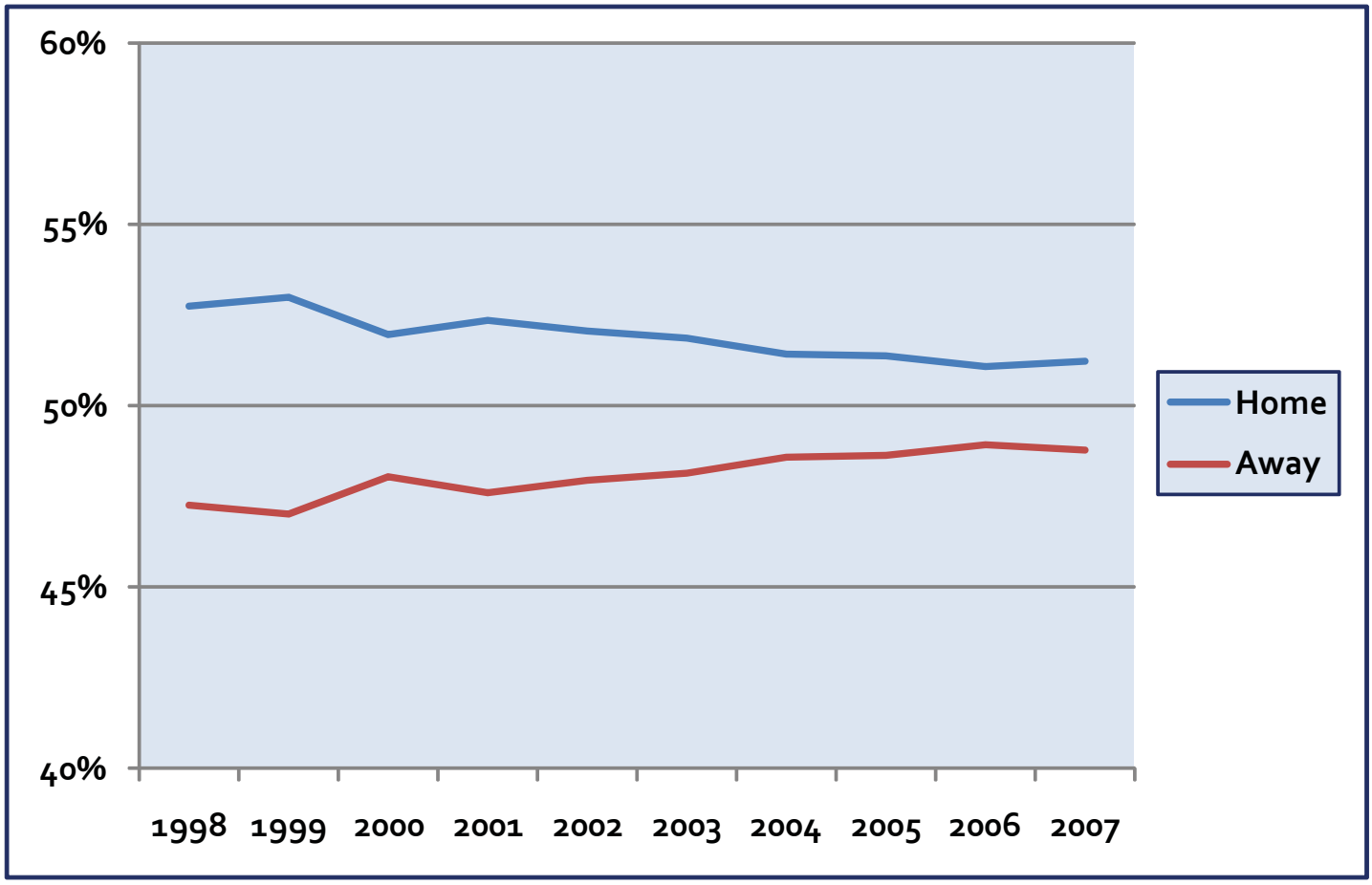
Source: Robert Rhoades, World Geography of the Potato, University of Georgia, Athens, GA

Potato Consumption

U.S. potato consumption patterns are changing. At one time consumers bought most of their potatoes to prepare for home consumption. This encouraged the sale of round white, general-purpose potatoes for home cooking. Round whites are the potato type that once predominated both on Maine farms and in the traditional Eastern consumer markets served by those farms.

For several decades there has been steady expansion of away-from-home food expenditures; today, nearly half the consumer's food dollar is spent on meals consumed away from home (figure 3). Not only are potatoes eaten away from home, but increasingly they are consumed in the form of chips, fries, and other processed foods. However, in the wake of the current bleak economic climate, we may see a return to home preparation of foods and perhaps a growth in the purchase of tablestock potatoes, which are inexpensive.

Figure 3. U.S. expenditures for food prepared at home and away from home, as a percentage of total food purchases



Source: Economic Research Service, U.S. Department of Agriculture http://www.ers.usda.gov/briefing/CPIFoodAndExpenditures/Data/table1.htm

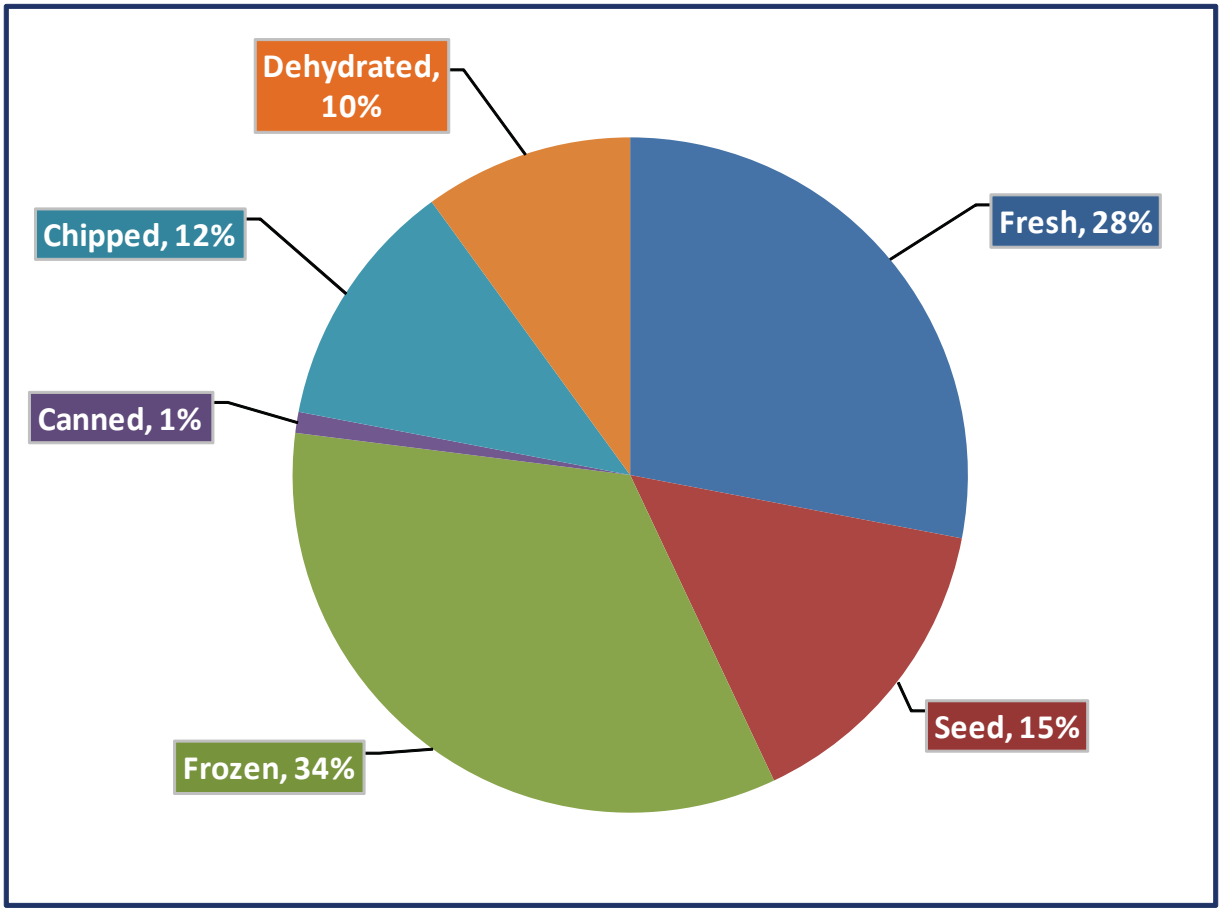
Potato Utilization

Today, more than half the potatoes grown in the United States are used for processing (see figure 4). Potatoes for processing into french fries, chips, and other prepared products are grown to specific standards. French fry processors generally use Russet potato varieties, and chip makers require specific varieties of long white potatoes. Even more important to processors than varieties are the color, solids, and sugar standards requirements. Processors encourage such standards by paying premiums to only producers who meet or exceed them. The premiums may make the difference between whether the farmer earns a profit or not.

Processing potato growers have learned that one of the best ways to earn these quality premiums is to construct and operate modern potato storage facilities. Potatoes are stored on-farm in storages owned, operated, and maintained by the farmers. Modern storage facilities, equipped with engineered ventilation systems and automated fans and louvers, are able to maintain the temperature of the potato pile at near-optimum levels until needed by the processors. Combined with modern handling equipment (which increases efficiency and reduces tuber damage), these storage facilities allow farmers to deliver potatoes with fewer bruises, better color, and cuts spoilage losses nearly year-round.

The restaurants and food service establishments that feed customers away from home affect the way potatoes are grown, packaged, and marketed. Rather than buy more frozen potato products, commercial potato users demand larger versions of the standby round white potato. These "Chef's" potatoes are large, round white potatoes and are easily turned into potato delicacies.

Figure 4. Utilization of potatoes in the United States



Source: National Potato Council (NPC 2002)

Trends

Several trends influenced potato marketing in recent decades. Chefs, chip makers, and home cooks have become increasingly interested in colorful potatoes. Reds, purples, and yellows are found in fancy restaurant servings, chip bags, and home pantries. "Fingerling" potatoes and "creamer" potatoes, marketed in clamshell packaging, are showing up in the produce aisle. Organic potatoes, many with the USDA organic logo, are becoming more popular. "Eco-labeled" or "IPM" (integrated pest management) potatoes grown with sustainable production methods are also entering the marketplace.

Fingerling

These novelty potatoes are naturally smaller than conventional ones. They are elongated and knobby, with fingerlike shapes. Ronnigers seed catalog lists 10 varieties.[2] A wide range of waxy and starchy fingerling varieties appear in markets, ranging from creamy white to purple, suitable for a variety of dishes.

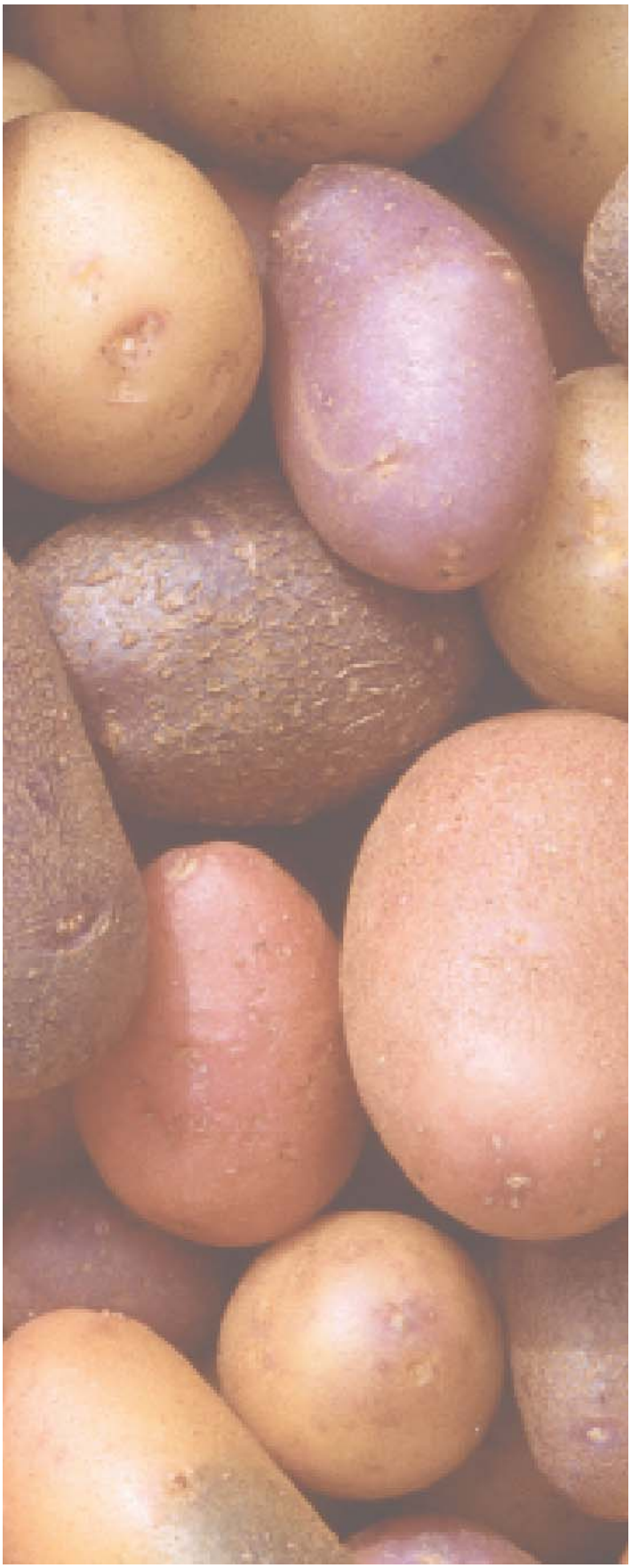
Some popular fingerling potato varieties include[3]:

- Banana
- Red Thumb
- French Fingerling
- Ozette
- La Ratte
- Rose Finn Apple

Creamer

These potatoes are harvested before complete maturity to keep them small and tender. They may be of any variety, but are often Yukon Gold or Red potato varieties. Creamers are usually about 1 inch in diameter; larger diameter (2 inch) immature potatoes are sold as new potatoes.[4]

In the past, about 90 percent of U.S. potatoes were planted in the spring and harvested in the fall. Potatoes from storage were marketed until the following June (ERS 2008-1 *Briefing Room*). Maine traditionally marketed potatoes in this fashion, but growers in Florida, Virginia, California, Delaware, and other areas market "new" potatoes harvested earlier in the season and sold more or less immediately. With changes in consumer tastes, there may be an increased demand for these "off season" and new potatoes.



2 http://www.ronnigers.com

3 Seed Savers. 2008 http://www.seedsavers.org/ and the Maine Potato Lady 2008 https://www.mainepotatolady.com

4 Recipe.Tips.com glossary of cooking terms. http://www.recipetips.com/glossary-term/t--35863/creamer-potato.asp

The Increased Interest in Organic and Sustainably Grown Potatoes

Sales of organic and sustainably grown vegetables, including potatoes, have risen dramatically in recent years. The Organic Trade Association (OTA) reports that sales of organic food have grown from $1 billion in 1990 to nearly $17 billion in 2006, projecting $23.6 billion in 2008. In OTA's *Organic Trade Association's 2007 Manufacturer Survey,*[5] organic fruits and vegetables accounted for nearly $7 billion of the $17 billion total organic food and beverage sales.

Organic Prices

An article in the winter 2008 edition of *Spudman*[6] pointed out that Canadian organic potato growers receive 1.5 to 2 times the conventional price, but marketable potatoes from organic farms yield only about half that of conventional.

Organic retail, terminal market, and shipping point prices are now being reported by AMS in addition to the prices for conventionally grown. AMS price reports[7] often show higher prices for organic produce, including potatoes. However, data from these price reports must be examined carefully to determine if the potatoes compared are of similar size, condition, packaging, production area, and variety. In addition, historical price data for organics are limited. Other market conditions, such as a shortfall in supply, can also affect prices, so price differences between conventional and organic potatoes may be caused by other factors.

Organic price information from other sources sometimes is posted on the Internet. These prices are generally based on USDA data, as reported by AMS. Sometimes large price premiums are shown on these non-USDA Web sites. The authors urge caution in making business decisions based solely on prices quoted on such Web sites.

Organic Certification

Growers of certified organic products must adhere to strict requirements, which include prohibition of some substances used in conventional pesticides and fertilizers. These include limitations on the types of spray materials and fertilizer used and sources of seed potatoes. Conventional and organic products must be kept separate. There is a 3-year conversion period for cropland. Information on the USDA National Organic Program is available from AMS.[8] Information on how to become certified as an organic producer in Maine is available from Maine Organic Farmers and Gardeners Association.[9] Information on acceptable spray materials is available from the Organic Materials Review Institute.[10]

Organic Potato Varieties

Most conventionally grown tablestock potato varieties are also available organically grown. However, with organic products:

- Seed potatoes must be certified organic.
- Customers may want something different and special to justify the higher price for organic potatoes.
- Farmers need to justify their higher production costs (and higher selling prices) by growing items not commonly available in local chain stores.
- Buyers for organic food outlets need a reason to justify selecting one farmer's produce over another's.

Some organic potato varieties for sale on the Internet include:

- Yukon Gold
- Swedish Peanut
- Rose Gold
- Rose Finn
- Reddale
- Red Cloud
- Onaway
- King Harry
- Island Sunshine
- Elba
- Cranberry Red
- Carola
- Caribe
- Butte
- Russian Banana
- All Blue

Organic potato production is not risk-free. Diseases such as late blight can start in a home garden or on an organic potato farm and then spread to neighboring potato fields. When there is an outbreak, affected fields require treatment—either with chemical sprays, or by being plowed under. This point was brought up by members of the Maine Potato Board during our visits to Presque Isle and is an issue that all potato growers should keep in mind.

More information about marketing organic potatoes is presented in a later section.

5 www.OTA.com

6 http://spudsmart.ca/images/winter08.pdf (PDF)

7 http://www.ams.gov

8 http://www.ams.usda.gov/nop

9 http://www.MOFGA.org

10 http://www.omri.org

Eco-Labeling

Integrated Pest Management (IPM) production, eco-labeling, and other formal and informal marketing schemes are ways producers can market their food as being produced using sustainable methods.

Sustainability has economic, community, and environmental components. It brings communities access to wholesome food, open spaces, and clean water and encourages economic growth that can persist over time. Other benefits include improved soil, water, and air, as sustainable farming operations do not degrade the environment.

Depending on how sustainable is defined, production methods could allow pesticides and fertilizers prohibited under organic regulations. But, although these operations might use some of these substances, they still could claim sustainable stewardship and responsibility by applying them only sparingly and prudently.

IPM started more than 40 years ago with entomologists promoting the use of computer models, weather stations, field scouts, and insect traps to identify threshold levels of insect presence that would cause economic harm to a crop. Because sprays were not used until this threshold was crossed, the once-typical application of 13 separate sprays in apple orchards was cut in half. The use of IPM techniques on today's farms is an example of an all-too-rare "win-win" situation. The farmers win by spending less time and money on spraying crops, and the environment wins because fewer chemicals are used.

Eco-labeling is a term for programs that use specific agricultural production methods designed to protect the environment, as well as the food produced, from harm. Red Tomato[11] has an Eco Apple label on northeast-grown apples that appears to be succeeding in marketing apples to health-conscious consumers in stores such as Whole Foods Market.

The Red Tomato/Eco Apple program is an IPM-based program with some additional limitations on what pesticides are allowed. According to the company's Web site,[12] "Some pesticides that are allowed in conventional production, such as neurotoxic and broadly toxic organophosphates, are prohibited altogether for the Eco Apple program." Some organically acceptable materials are not allowed under the Red Tomato program because Red Tomato believes that less toxic conventional materials are available.

The Food Alliance,[13] another example of eco-labeling, provides a certification and third-party auditing program that allows farmers, ranchers, and food handlers to make claims of sustainability. The audit examines pesticide storage, record keeping, spray equipment calibration, and pesticide use and application, among other things; certification limits the chemicals that operations may use. The audits also have sections on soil and water conservation and wildlife habitat.

Other groups that have eco-labeling initiatives include Core Values Northeast, Protected Harvest, and the University of Wisconsin's Eco-Apple and Eco-Potato Programs.

The University of Wisconsin's[14] Eco-Apple and Eco-Potato programs assist growers in marketing sustainably grown crops. Apples grown and marketed under this program use an updated IPM system with baseline data from Wisconsin growers' pesticide usage. The program calculates a weighted score for each farm, based on improvements in lowering overall toxicity to the fruit as well as the environment.

Growers marketing potatoes under the Wisconsin Eco-Potato program's Healthy Grown[15] label must get a minimum score in each area:

- IPM adoption
- Lowered toxicity
- Natural community standard

To ensure credibility and transparency, the potatoes are certified by Protected Harvest, an independent, non-profit organization.[16] According to Dr. Deana Knuteson, BioIPM Coordinator for the University of Wisconsin, the project has been successful in its ecological aims, but says "sales have been slow" and "we were ahead of our time" [17] (Houlihan 2008).

11 http://www.redtomato.com

12 http://www.redtomato.org

13 http://www.foodalliance.org

14 http://www.thinkipm.org/apples/index.html

15 http://www.csrees.usda.gov/newsroom/impact/2008/nri/06261_healthy_grown.html

16 http://www.protectedharvest.org/

17 http://www.wisconsinpotatoes.com/_PDF/BadgerCommonTaterInterviews/KnutesonInterview0908.pdf (PDF)

The Wisconsin Eco-Potato Program

The Wisconsin Eco-Potato program began in 1996 as a cooperative effort of the Wisconsin Potato and Vegetable Growers Association (WPVGA), the World Wildlife Fund (WWF), and the University of Wisconsin IPM team to reduce the use of 11 high-risk pesticides that affect both humans and wildlife. It uses "Bio intensive" IPM as a basis for even further reducing the use of the pesticides beyond conventional IPM methods. Toxicity levels were reduced 37 percent from the baseline values in the first 4 years of the program. In addition to IPM, a wildlife/environment component requires farmers to restore and/or maintain selected privately owned nonagricultural parcels. The land is managed according to an annual plan and the hours and expenses invested are recorded and certified as part of the program.

The Natural Community Standard is part of the protocol farmers follow for certification under the Wisconsin Eco-Potato program. It includes identification of non-crop land near crop fields and the selection of management activities, such as prescribed burning and invasive species removal, which increases biodiversity. The program also requires farm monitoring to validate increased environmental services.

Niche Marketing

Niche marketing means supplying customers with the specific products they want. The difference between niche markets and the broader marketplace is that niche products are differentiated—by physical characteristics (color, flavor, texture, protein level), place of origin (Grown in Maine), production method (organic, eco, IPM), packaging and labeling.

AMS and the Upper Great Plains Transportation Institute at North Dakota State University teamed up to research the logistics of serving several different niche markets.[18] The report examines three case studies involving different niche markets for potatoes. These include:

- Organic Potatoes
- Dehydrated Potato Products
- GMO Tested Potato Products for Export

Heritage potatoes

Heritage potatoes, like other heritage or heirloom vegetables, are older varieties that are still grown. The Seed Savers Exchange defines heirloom vegetables as "any garden plant that has a history of being passed down within a family."[19]

Sometimes individual families or small regions keep a variety growing, saving seed potatoes year after year, long after the old variety has been replaced in other growing areas. Only a few heritage varieties are widely grown commercially. Russet Burbank is a commercial mainstay despite its age, and Irish Cobbler is an old potato variety that remains popular because of its early maturity and reputation for good culinary qualities.

An English farm, Carroll's Heritage Potatoes,[20] grows about 20 different heritage potato varieties on 50 acres in Northumberland, England. Each variety has a historically relevant name, a date, and a "fascinating tale" describing its history. They are marketed through local shops and farmers markets. Not surprisingly, these particular heritage varieties claim to be unique and more flavorful than most of today's commercial varieties.

Heritage Potato Varieties

Below is a list of some of the more common heritage potato varieties available for sale, with the year each was introduced, where available. Yukon Gold is not a particularly old potato, but is sometimes marketed as a heritage potato.

Some Heritage Potato Varieties presently being marketed on the Internet include:

- Dunbar Rover (1936)
- Red Duke of York (1942)
- Ratte (1872)
- Epicure (1897)
- Sharpes Express (1900)
- Witch Hill (1881)
- Mr. Little's Yetholm Gypsy (1899)
- Shetland Black
- Salad Blue
- Highland Burgundy Red
- Edzell Blue
- Fortyfold
- Jersey Royal
- King Edward
- Yukon Gold

18 http://www.ams.usda.gov/AMSv1.0/getfile?dDocName=STELPRDC5064987

19 http://www.seedsavers.org

20 http://www.heritage-potatoes.co.uk

Agriculture and Agri-Food Canada maintains seed banks in several locations in Canada, including holdings in New Brunswick of potato varieties that may be classified as "heritage." Agriculture Canada entertains requests for seed from this collection from the United States as well as Canadian entities. The list is posted on the Agriculture Canada Web site,[21] and reproduced in appendix 7 of this report.

A comprehensive list of heritage potato varieties, including their sizes, color, taste, productivity, and disease susceptibility is maintained by the Irish Seed Savers[22] in its potato seed catalog. The Irish Seed Savers also have performed taste tests of some heritage varieties. The results of one such test are shown in Table 1. Sharps Express, an early long white potato, was the clear favorite of the assembled potato growers. The table lists the early-season heritage potatoes grown by the Irish Seed Saver members, with a relative "score" assigned by the participants. A higher score means better flavor. The authors of the article stated the results were useful for selecting heritage varieties to grow for market.

Table 1. Irish Seed Savers list of heritage varieties with taste scores

Sharps Express	141
Red Duke of York	118
Ballydoon	116
May Queen	100
Epicure	100
Ulster Sceptre	88
Land Leaguer	86
Irish Peace	46

Source: Irish Seed Savers [23]

The heritage designation is no guarantee of quality or marketing success. It's important to note that because a potato is classified as a heritage potato doesn't necessarily assure it is a good potato to grow, store, market, or eat. For example, the famine potatoes of Ireland were Black, Apple, Cup, and Lumper, with Lumper the most commonly grown. From all reports, Apple and some others were tasty, but Lumper was considered a potato that "pigs would not eat, if they had a choice." (Fagan, 2000) In desperate times, Lumper became the dominant variety due to its high yield. Unfortunately, this variety had little resistance to late blight and thus contributed to the Irish Potato Famine. Despite these serious limitations, it is ironic that "heritage" Lumper seed potatoes are available for planting from a certified U.S. seed source,[24] while other, tastier, old varieties remain unavailable.

Growers should carefully study the heritage varieties listed in this document or on Web sites or seed catalogs before deciding to plant. Considerations include:

- Can they be grown under local conditions?
- Is there an established market for the variety?
- Is the yield reasonable?
- Does it have remarkable size, shape, or color characteristic that is different from other potatoes in the marketplace?
- Is certified seed available?

21 http://dsp-psd.pwgsc.gc.ca/Collection/A47-8-8-2001E.pdf (PDF)

22 http://www.Irishseedsavers.ie

23 http://www.irishseedsavers.ie/article.php?artid=97

24 http://tater-mater.blogspot.com

U.S. Potato Prices and Acreage

Recent statistical analysis suggests that, by and large, U.S. potato growers are not benefiting from steady increases in retail potato prices. In absolute terms, U.S. retail potato prices have risen over time; figure 6 shows the average retail price of one pound of round white tablestock potatoes increased about 50 percent, from $0.335 to $0.517, between January 1997 and January 2007. However, during the same period, the average price received by farmers rose from 5 cents per pound to only 6.6 cents[25] (see figure 7).

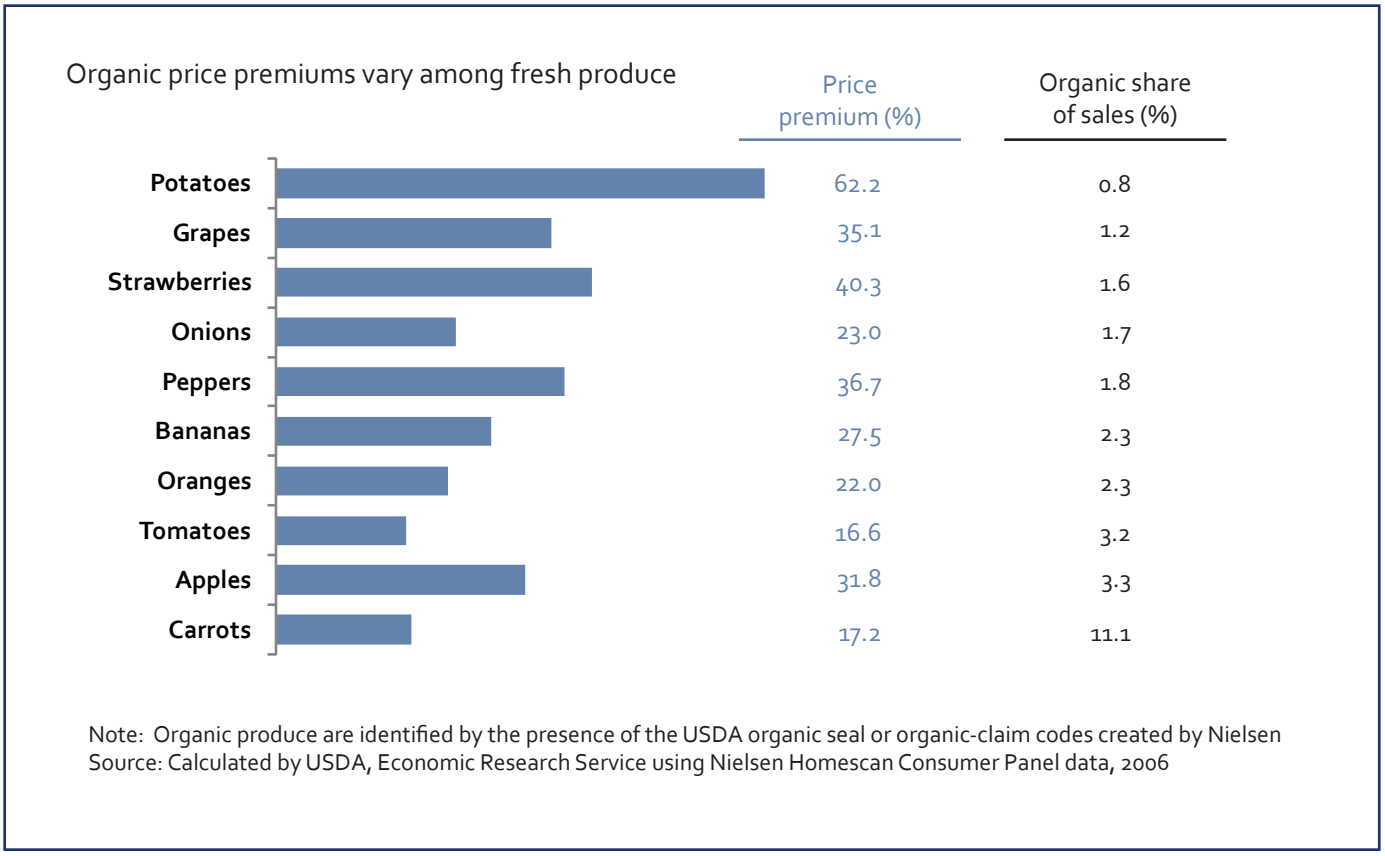
In his 2001 book, Dr Joseph Guenthner of the University of Idaho (Guenthner 2001) argues that the relative weakness in farm returns from potato production is because potatoes have become an undifferentiated commodity and, consequently, only increases in production and efficiency will increase farmer returns.

According to ERS statistics, American potato farmers grossed about $2,000 per acre from potato sales (ERS 2008-2). With a U.S. average yield of 298 hundredweight per acre, this equates to about $0.07 per pound, or about 13 percent of the retail price.

The USDA's National Agricultural Statistics Service (NASS) reports similar results, estimating U.S. season average grower prices for all potatoes at 7.3 and 7.5 cents per pound in 2006 and 2007, respectively. Combining 2006 and 2007, and dividing NASS estimates of the U.S. value of potato sales by acres harvested, a 2-year average revenue per acre yield of $2,706. During the same period, 2006–2007, NASS reports (NASS 2009) an average price of 7.85 cents per pound in Maine for all varieties for all purposes.

Organic potato acreage has hovered around 7,000 acres since 2000, totaling about 0.4 percent of total U.S. potato acreage (Guenthner et al. 2007). The organic share of the U.S. fresh potato market is 0.8 percent and the premium paid by consumers for organic potatoes is reported by ERS as 62.2 percent above conventional, the highest of all organic products. (Smith and Lin 2009). The same article notes that, even though organic potatoes pay growers the highest premium, organic potatoes have one of the smallest shares of the market, less than 1 percent of potato sales. Organic carrots, in comparison, carry a relatively small premium, but represent a respectable 11.1 percent share of all carrot sales (see figure 5).

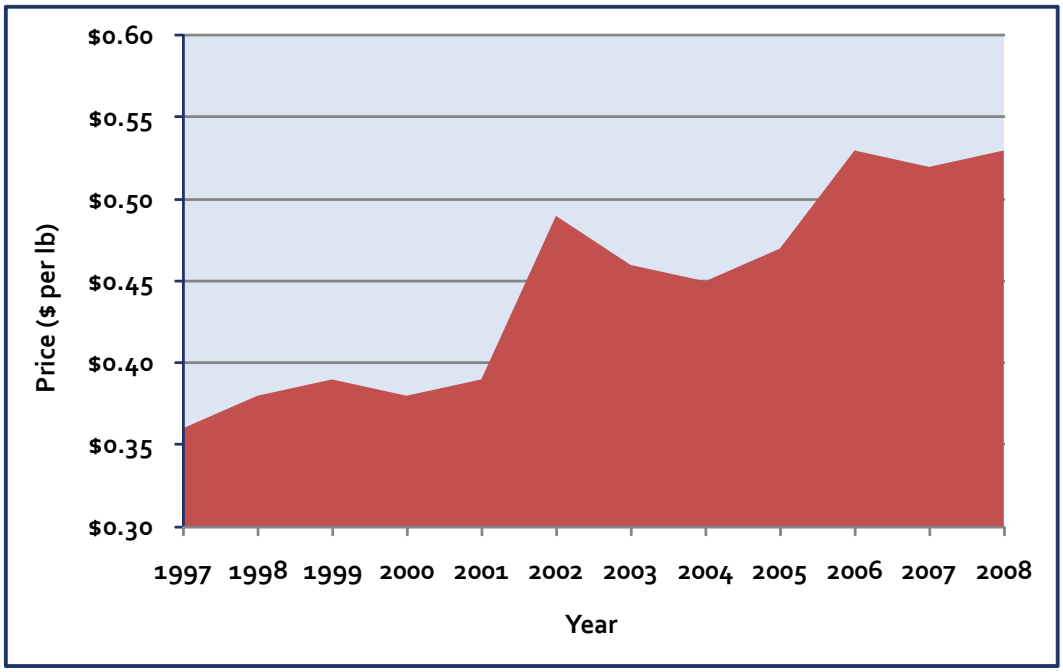
Figure 5. Price premiums paid for organic produce[26]



Note: Organic produce are identified by the presence of the USDA organic seal or organic-claim codes created by Nielsen
Source: Calculated by USDA, Economic Research Service using Nielsen Homescan Consumer Panel data, 2006

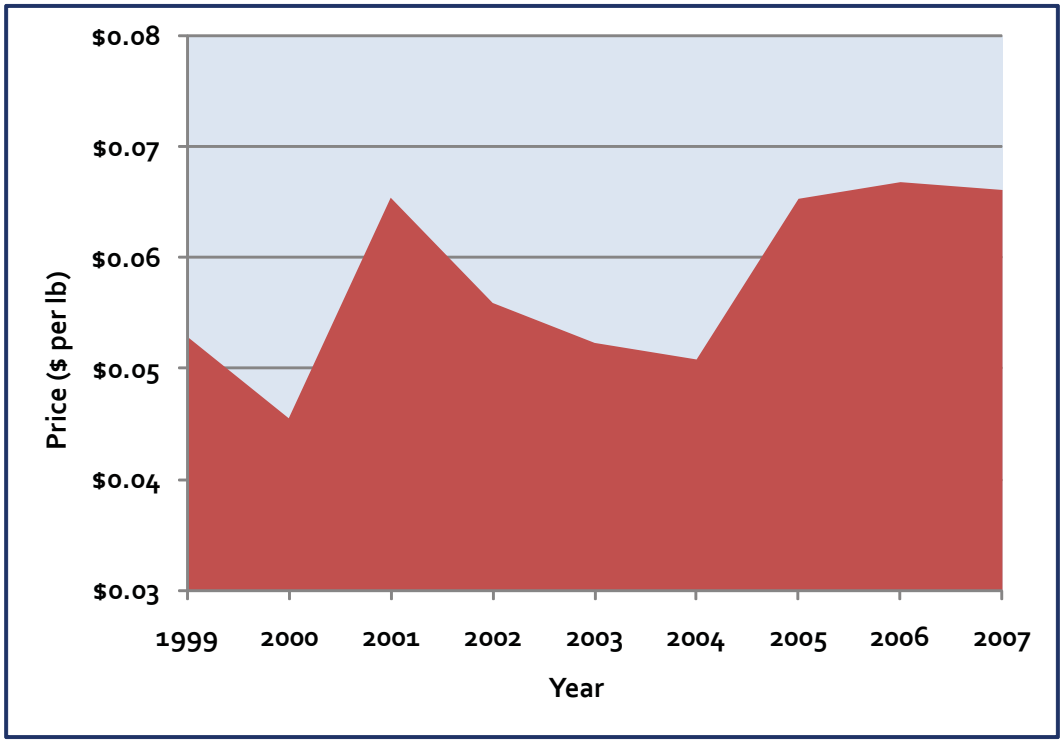
25 ERS 2008. Vegetable and Melons outlook. http://www.ers.usda.gov
26 Smith and Lin 2009.

Figure 6. Average retail price of round white potatoes 1997-2008



Source: Bureau of Labor Statistics (BLS)

Figure 7. Average price paid to U.S. farmers for fall potatoes, 1999-2007

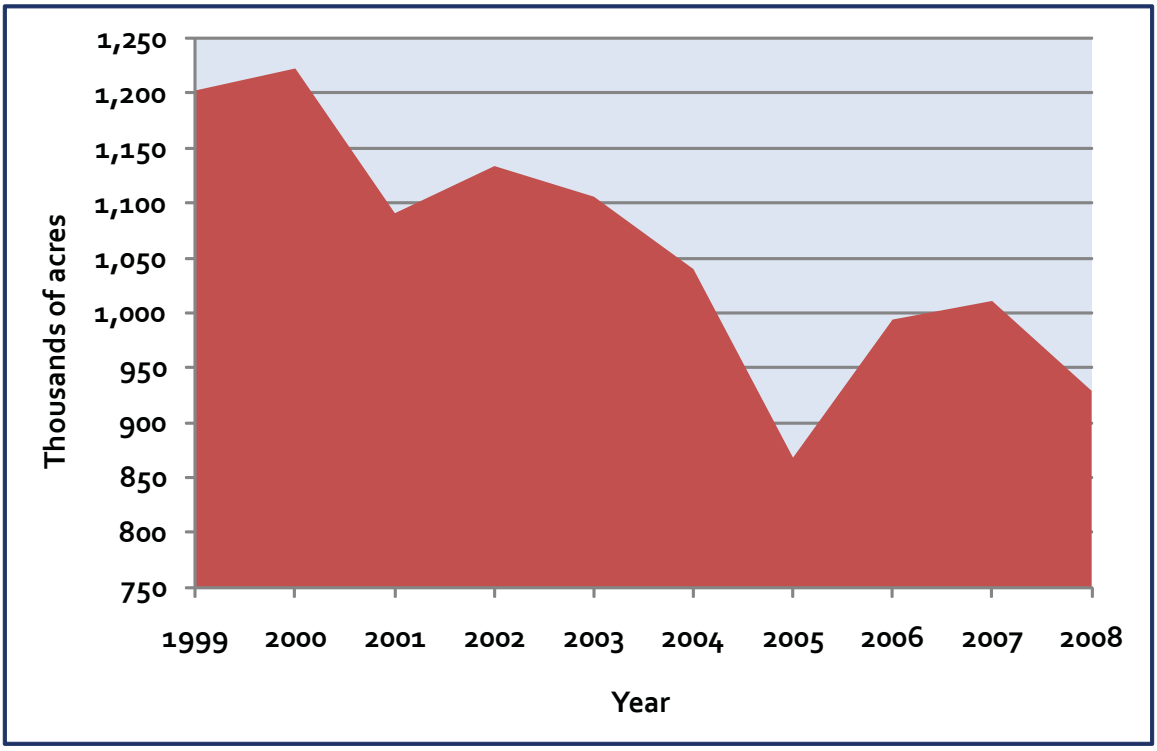


Source: ERS Vegetable and Melons outlook http://www.ERS.USDA.gov

Tablestock potato prices respond to weather, market conditions, and the availability of imported (e.g., Canadian) potatoes and potato products. Low potato prices at the beginning of this decade affected potato planting decisions, leading to substantial acreage reductions (figure 8). The acreage reduction may have been prompted by increases in grain and soybean prices, and assisted by acreage reduction strategies of the U.S. Potato Marketing Cooperative (see "supply management strategies" in a later section).

Tablestock potato prices generally are highest for the winter crop and lowest for fall potatoes, but these can vary. In 2007 the U.S. average price of fall potatoes was $7.05 per hundredweight, and $18.50 for the winter crop. Yet the yield for fall potatoes was 410 hundredweight per acre, and the yield for winter potatoes was only 210 hundredweight per acre.[27] The fall crop is the largest in terms of total production as well as yield, given the climatic conditions in many areas that limit off-season production. Other factors, such as varying yields, shipping losses, and repacking costs for new potatoes make returns similar regardless of the season produced. Prices for tablestock potatoes are traditionally higher than prices paid for processing potatoes, with prices nationwide from 2006 to 2008 between $2.00–$3.00 higher per hundredweight for tablestock over the average price paid for all potatoes including processing.[28] However, processing potatoes are grown under contract and the prices paid are more predictable than the more volatile tablestock prices.

Figure 8. U.S. fall potato acreage



Source: ERS Vegetable and Melons Outlook http://www.ERS.USDA.gov

27 NASS, Quick Stats (Ag Statistics Database) http://www.nass.usda.gov/Data_and_Statistics/Quick_Stats/index.asp

28 ERS, Vegetable and Melon Outlook http://www.ers.usda.gov/Publications/VGS/2008/12Dec/VGS330.pdf (PDF)

International Potato Trade

Potatoes are grown throughout the world, and many countries participate both as exporters and importers. In the past, Russia and Poland led the world in potato production but, in recent years, China and India have the leading positions.

Trade in potatoes comes in all forms—fresh, processed, frozen, and chips. However, fresh movements between countries are limited by phytosanitary concerns (disease, insects, etc.). Potatoes also have a relatively low value per ton (perhaps $200 per ton), and the need for refrigeration and careful handling also deducts from their desirability as an international trade item. Higher value potato products such as fries and chips and such shelf-stable items as potato starch and flour are more commonly traded. The cross-border trade between the United States and Canada incorporates every variety of potato, including fresh market, processing, seed, and tablestock.

Trade data show that "fresh potatoes" often refers to potatoes that are destined for processing in the receiving country or to shipments of seed potatoes. Seed potatoes are probably the most stringently examined fresh potatoes in the marketing chain because there is a risk that an infected or infested seed potato will be planted in the receiving county's farmland, spreading disease and insect problems.

For a variety of reasons, the most popular product in international potato trade is frozen potatoes, especially french fries.

Fries are a leading export item

Since 2005, the U.S. potato industry has enjoyed a trade surplus in potatoes and potato products. Net export value (U.S. exports minus imports) of potatoes and potato products in 2007 totaled $224 million. Japan, Canada, and Mexico are the top three export markets; together, they account for two-thirds of total U.S. potato exports. Most exports consist of processed potatoes, such as frozen french fries, potato chips, and dehydrated potato products (e.g., potato flakes, granules, and flour). (ERS 2008)

Leading Potato Exporters

The United States is a major potato exporter, not because of its large fresh production, but because of its ability to produce frozen potato products. Canada, China, the European Union, and the United States account for nearly one-third of all potato exports to world markets. (FAS 2008)

However, smaller countries (each with less than 1 percent market share) provide more than 57 percent of *fresh* potatoes in international trade. Each of the producing countries (the EU is often considered a single entity in the statistics) operates a little differently. For example, Canada is an export-based producer, but the United States and the EU may import nearly as many potatoes as they export.

Fresh potatoes are highly perishable and may contain insects or potato diseases. Perishable products that could inadvertently deliver diseases and insects to the receiving nation are a disincentive to trade. It is safer for a potato-producing nation such as Japan to import frozen potato products rather than fresh potatoes.

"Fresh," in the vocabulary of international trade, designates the potatoes were unprocessed at the time of shipping, even if intended for processing. Thus, imports and exports of fresh potatoes do not necessarily serve a "tablestock market," but reach the retail outlet in processed form. Japan, for example, processes most fresh potatoes imported from the United States into chips.

U.S. Imports of Fresh Potatoes

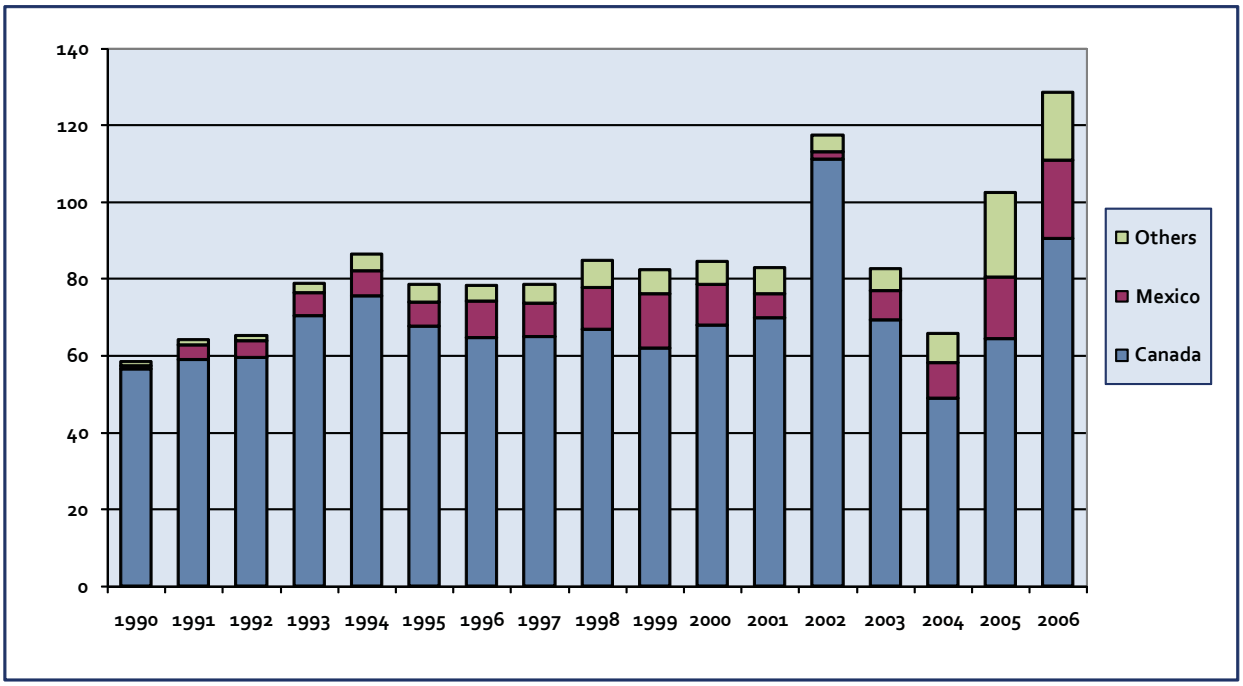
Most U.S. potato imports are from Canada. Canada has an export-based potato industry, and the United States is its primary market. For years, the strength of the U.S. dollar aided Canada in competing in the U.S. market. Recent weakness in the dollar should enable U.S. producers to become more price-competitive and enable Maine-grown potatoes to replace some of the imported Canadian potatoes now entering the United States.

U.S. Exports of Fresh Potatoes

Figure 9 shows recent U.S. fresh potato exports. The value of those exports grew from $59 million in 1990 to $129 million in 2007, more than doubling.

Most of these exports went to Canada, most likely destined for potato processing plants. The Canadian share of total exports fell slightly due to increased shipments to Mexico and the Far East. In 1990, exports to Canada represented 96 percent of total exports; in 2006 they represented 70 percent, with exports to Mexico responsible for the difference (1.7 percent of the total in 1990 and 16 percent in 2006). Figure 9 shows dollar levels of U.S. fresh potato exports to its major customers.

Figure 9. Value of U.S. fresh potato exports ($millions)



Source: ERS, Potato Statistics, Fresh Potato Exports http://usda.mannlib.cornell.edu/usda/ers/91011/Table077.xls

Status of the Maine Potato Industry

In 2006 and 2008 the Maine Potato Board commissioned two "Review(s) of the Industry" (MPB 2008) that describe the industry in those years and how it changed during the previous 10 years. Some of the information in those reports is summarized here.

Yields

Potato yields in Maine have remained relatively stagnant. In 1950, Maine farmers harvested 288 hundredweight per acre; in 2007, they averaged 290 hundredweight per acre (NASS 2008). The U.S. average was about 298 hundredweight per acre. Some irrigated Western U.S. farms may produce as much as 400 to 500 hundredweight per acre (ERS 2008-1), indicating that irrigation, which increased the yield for the Western United States, might also increase yields in Maine. However, irrigation has yet to be used in a significant way in northern Maine. In the dry Western States, irrigation is a necessity, as normal rainfall is insufficient to grow potatoes. In Maine, irrigation acts more as a backup to rainfall, providing water in drought years and raising average yields by eliminating occasional poor harvests caused by drought.

Acreage

Total Maine potato acreage fell between 1980 and 2006 from more than 100,000 planted acres to about 60,000, consistent with a long-term trend that has seen potato production decline in the East and Midwest and increasing production in the West and Canada. Other traditional potato production areas such as Pennsylvania and Michigan have also suffered large declines in potato acreage. Much of the decline has taken place in tablestock production, only part of which has been replaced with production destined for french fry and chip markets.

Processing

Maine produces far more potatoes for processing today than in previous years. The construction and expansion of potato processing facilities in Maine and Connecticut benefits Maine farmers in two important ways: providing stable, predictable markets for Maine potatoes and increasing the number and quality of potato storage facilities on Maine farms.

Cull potatoes

There is a lack of markets in Maine for number 2 grade and cull potatoes. About 30–40 percent of Maine's production is less than number 1 grade. Other production areas, which have similar or even higher cull rates, are able to use these "off grade" potatoes for canning, starch, dehydration, flakes, meal, and plastics. The lack of a market for culls and low-grade potatoes encourages less stringent grading by farmers to improve their packout. According to the farmers we interviewed, Maine growers may be offered only $1.00 per hundredweight for lower grade and cull potatoes, if they can be sold at all, compared with $7.26 (NASS 2009), the 6-year average price for Maine potatoes sold for processing and tablestock.

Potato Grades

In the United States, the USDA, with industry participation, has instituted four distinct grading standards for potatoes: fresh market potatoes, potatoes for seed, processing potatoes, and chipping potatoes. Each standard has permitted conditions, defect levels, and minimum and maximum sizes that determine grade.

Common to these standards is a quality grade (No. 1 or No. 2) and a size designation (creamer, Chefs, Size A, Size B, small, medium, or large). Potatoes in count boxes have separate weight standards.

The State of Maine has its own grade standards,[29] based on the U.S. standard but slightly tougher. For example the "Maine Grade" round white potato must meet the U.S. Number 1 quality standard as well as the Size A size standard and have a minimum diameter of 2 inches, slightly larger than the U.S. Number 1 Grade. The "Maine Premium" Grade has a minimum diameter of 2.25 inches in addition to meeting all other size and quality criteria of U.S. Number 1.

29 http://www.maine.gov/sos/cec/rules/01/chaps01.htm

Loss of Markets

Maine's loss of its traditional markets to farmers in Canada and the Western United States means it has gradually lost its dominant position as the supplier of tablestock potatoes for Boston, New England, the Mid-Atlantic region, and North Carolina. There are several possible explanations for this, including the low cost of irrigation water in the Western United States; smart, aggressive marketing by Idaho; past deficiencies in storage and packout quality in Maine; and perhaps the unwillingness of Maine producers to market cooperatively.

The relative weakness of Canadian currency to the U.S. dollar has also affected Maine potato sales. Since the 1970s, the strong U.S. dollar and the relatively weak Canadian currency have allowed Canadian potatoes to compete strongly with those grown in Maine and in other U.S. production areas. After 30 years of a weak Canadian dollar, the situation was reversed in the past couple of years. (The subject is discussed further in a later section, under "Canadian Competition.")

Maine Potato Varieties

In the past, "round white" tablestock potatoes were the dominant Maine potato and, until recently, Katahdin and Kennebec were two favorites. Consumer acceptance of these varieties was good and their quality respected and consistent. These varieties, while still grown, have been replaced by newer "improved" varieties. Some of the farmers interviewed in Maine complained that, although superior in some aspects, these new varieties may lack consistent cooking results and flavor. This appears to be at least partly due to the marketing of several potato varieties together as generic "round white potatoes." These different varieties naturally had somewhat different results when prepared by consumers, and the farmers claimed the inconsistency led to consumer confusion and disappointment. The lack of consistency because different varieties were marketed as generic round whites or baking potatoes suggests limiting each category to one variety.

Several Maine potato growers and marketers told us the concept of identifying potatoes by variety and State of origin has proven difficult to sell to chain store buyers, erecting another barrier to proper product identification. Representatives of supermarket chains with multistate operations, they said, resist attempts to identify the potatoes they purchase as Maine grown, out of concern it might alienate consumers in neighboring States that also grow potatoes. However, in our observation, large supermarket chains frequently carry branded potatoes that identify the variety and State of origin on potato bags. This argues for a more aggressive, united marketing effort by Maine growers.

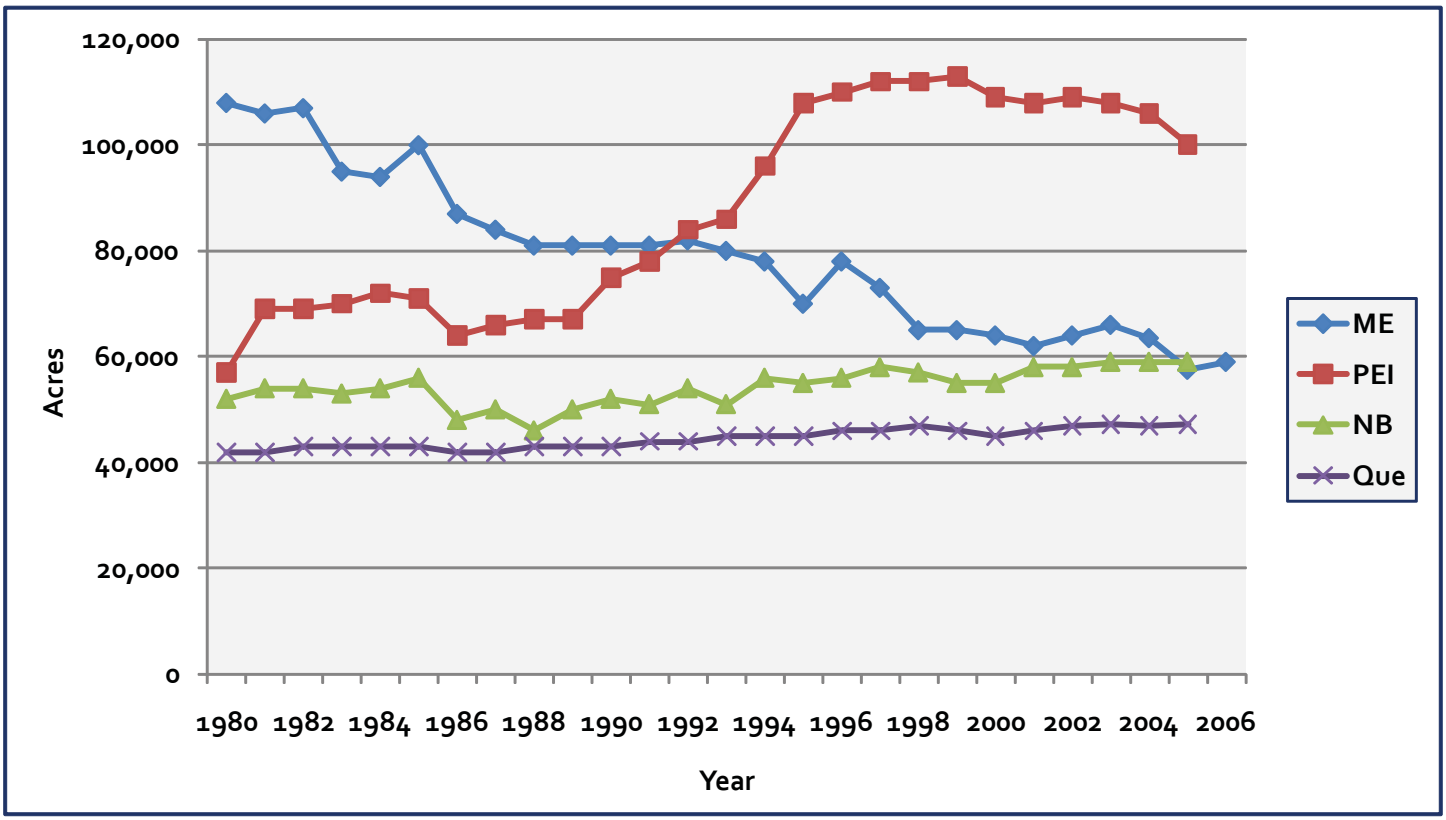
Farmers raising some potato varieties in Maine face technical difficulties. Red potatoes are not sufficiently colorful, Russets do not grow properly, and rocky soils damage potatoes, making harvesting of small potatoes problematic. Based on the results of these interviews, it would appear that further agronomic research is needed to identify the most promising potato varieties that would appeal to consumers and be suitable for northern Maine's climate and soil.

Canadian Competition

Increases in Canadian potato production directly affect Maine potato growers. Figure 10 shows the acreage planted in potatoes in Maine and the eastern Canadian Provinces of Prince Edward Island (PEI), New Brunswick (NB), and Quebec (Que). This region, traditionally the leaders in Canadian potato production, produces a high volume of potatoes, roughly equivalent to 15 percent of total U.S. production.

Within the region, a significant shift has occurred over the last several years. New Brunswick and Quebec production have remained fairly stable, rising just a few thousand acres between 1980 and 2007, but Prince Edward Island potato acreage increased from about 60,000 acres in 1980 to 109,000 acres in 1999. During the same period, Maine potato acreage dropped from 108,000 acres in 1980 to 60,000 acres today.

Figure 10. Potato acres planted in Maine and nearby Canadian Provinces



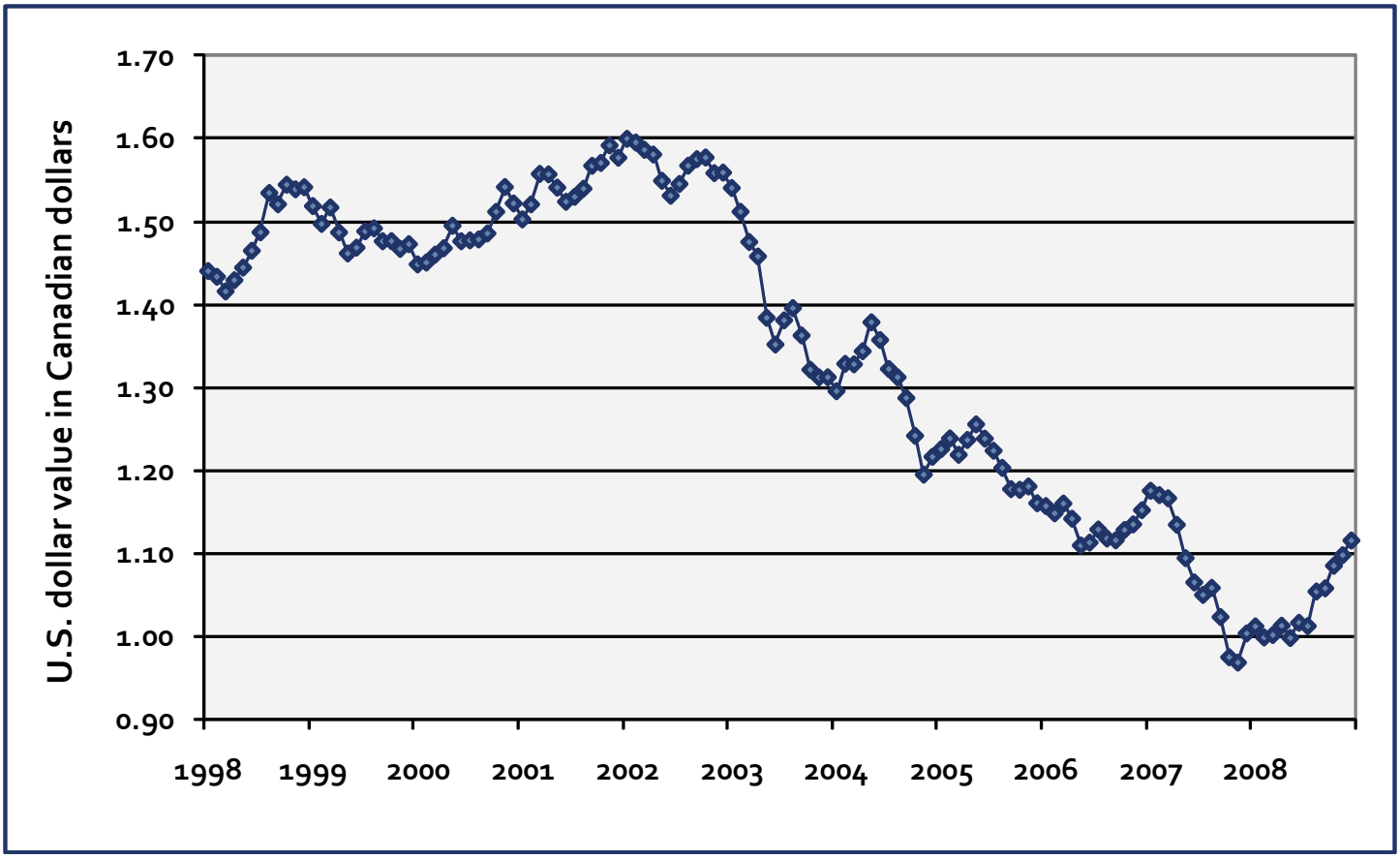
Source: Cheng (2004 and 2005) and Maine Potato Board

Currency Exchange Rates

Any mention of international trade must include a discussion of relative currency exchange values. In September 2007, the Canadian dollar traded at par (equal) to the U.S. dollar for the first time since 1976. After many weak years, the Canadian dollar's value rose on the back of strong demand for its export commodities, such as copper, gold, wheat, oil, and potatoes. As shown in figure 11, the U.S. dollar lost value after 2003, when it traded for 1.54 Canadian dollars. By January 2008, this ratio was down to 1.01, or nearly even.

Maine potato growers believe the weak Canadian dollar prior to 2003 encouraged U.S. potato buyers to prefer Canadian potatoes over those produced in Maine. According to the Maine producers, this led to a decline in Maine acreage and corresponding increases in acreage in Prince Edward Island and other parts of Canada. The decrease in the value of the U.S. dollar that began in 2003 and continued through the beginning of 2008 (shown in figure 11) reverse this trend somewhat, encouraging an increase in sales of Maine potatoes to Canadian processors.

Figure 11. Decline in value of U.S. dollar against Canadian dollar



Source: Bank of Canada (2008) http://www.bankofcanada.ca/cgi-bin/famecgi_fdps

Canadian Subsidies

Coinciding with increased potato acreage in Canada during the 1980s and 1990s has been improved storage and packing facilities. During a tour of storage and packing sheds in Maine and Prince Edward Island by one of the authors in 1989 (Berney), it was clear that Canadian facilities were far superior to many in Maine at the time. Some Maine farmers we spoke to in 2007 believed subsidies by Canadian government agencies helped construct them. A literature search reveals only a few examples of construction of storage facilities in Prince Edward Island with government support, so it is not clear that these claims are valid.

In 2004, the National Potato Board and Senators Susan Collins (R-ME) and Charles Schumer (D-NY) asked the U.S. Department of Commerce to investigate unfair trade practices in the potato industry by the Canadian and Provincial governments. Among the complaints cited were:

1. "New Technology Grants" to purchase potato handling and storage structures and equipment.
2. "Freight Assistance" subsidized transportation of potatoes, including to the U.S. market. (This program was said to have been phased out.)
3. "Net Income Stabilization Accounts (NISA)" that allowed potato farmers to deposit a percentage of sales into a NISA account and receive a matching contribution from the government, which could be saved or withdrawn as needed.
4. No-interest loans for potatoes in storage waiting to be sold.

The net effect of the report was limited. A full report of the investigation is available at the NPC Web site.[30] The Canadians responded by reducing the scope of some programs and making counterclaims about some U.S. farm programs they considered unfair to Canadian farmers. Meanwhile, farmers in both countries have been hurt by the low potato prices of the early and mid-2000s and, since that time, have concentrated on improving product quality and marketing, and implementing acreage reduction programs.

30 http://www.nationalpotatocouncil.org/NPC/p_documents/document_010407021042.DOC

Energy Costs

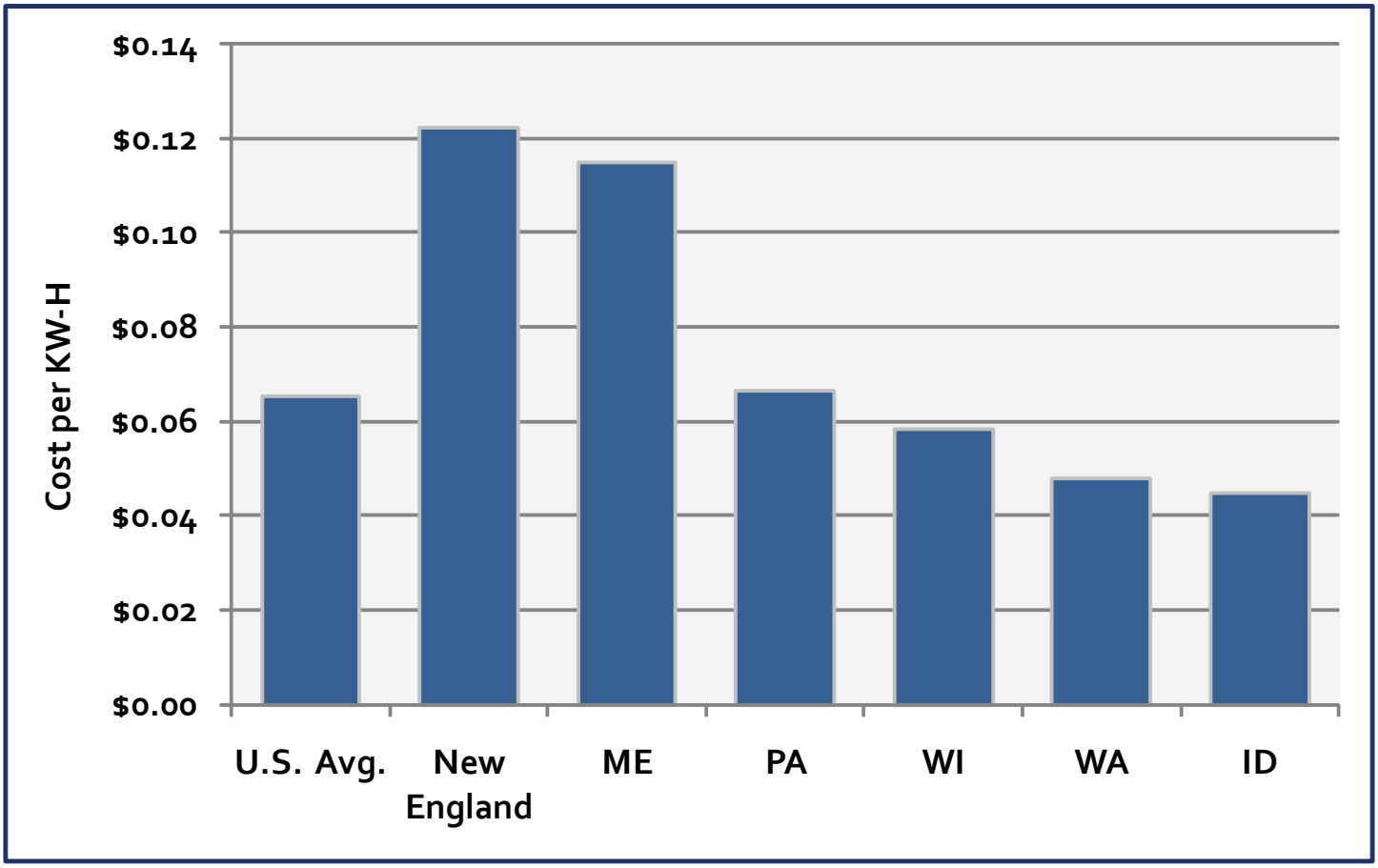
The rising costs of energy affect more than added transportation surcharges for Maine farmers. They affect nearly every area of production (e.g., fuel for equipment, price of fertilizer), as well as the cost efficiency of storage, processing, and marketing potatoes.

During our discussions with potato growers in Maine, we heard comments that electric utility rates in the State are steep compared with those in other potato-growing regions, significantly affecting businesses that use electricity for processing, heating, drying, and cooling. As illustrated by figure 12 and Appendix 4, Maine's rates for electricity are well above the national average, higher than those in other potato-producing States. However, the rates are comparable to the other New England States.

Electric rates shown in figure 12 are for the industrial sector, as agriculture falls under that category. (Residential rates usually follow similar patterns.) As of September 2007, the average rate in the United States was 6.55 cents per kilowatt-hour, the New England average was 12.23, the Maine average was 11.49, the Idaho average was 4.48, and the Washington State average was 4.78 (all in cents per kilowatt-hour). In other words, the electric rate in Maine was 2.5 times the rates in Idaho and Washington State.

Pennsylvania, a major destination for Maine tablestock potatoes, had industrial electric rates that were nearly half of what was paid in Maine, allowing Pennsylvania producers to store, pack, and process potatoes with lower operating costs.

Figure 12. 2008 electric rates for industrial users in Maine and other potato-growing areas



Source: U.S. Energy Information Administration (EIA) 2008 http://www.eia.doe.gov/fuelelectric.html

In the fresh potato industry, electricity is needed for processing and storing potatoes. Fans, conveyors, and equipment for washing, sorting, and packaging all run on electric power. In the potato processing industry, energy is required to freeze (electricity) and dehydrate (usually propane or natural gas).

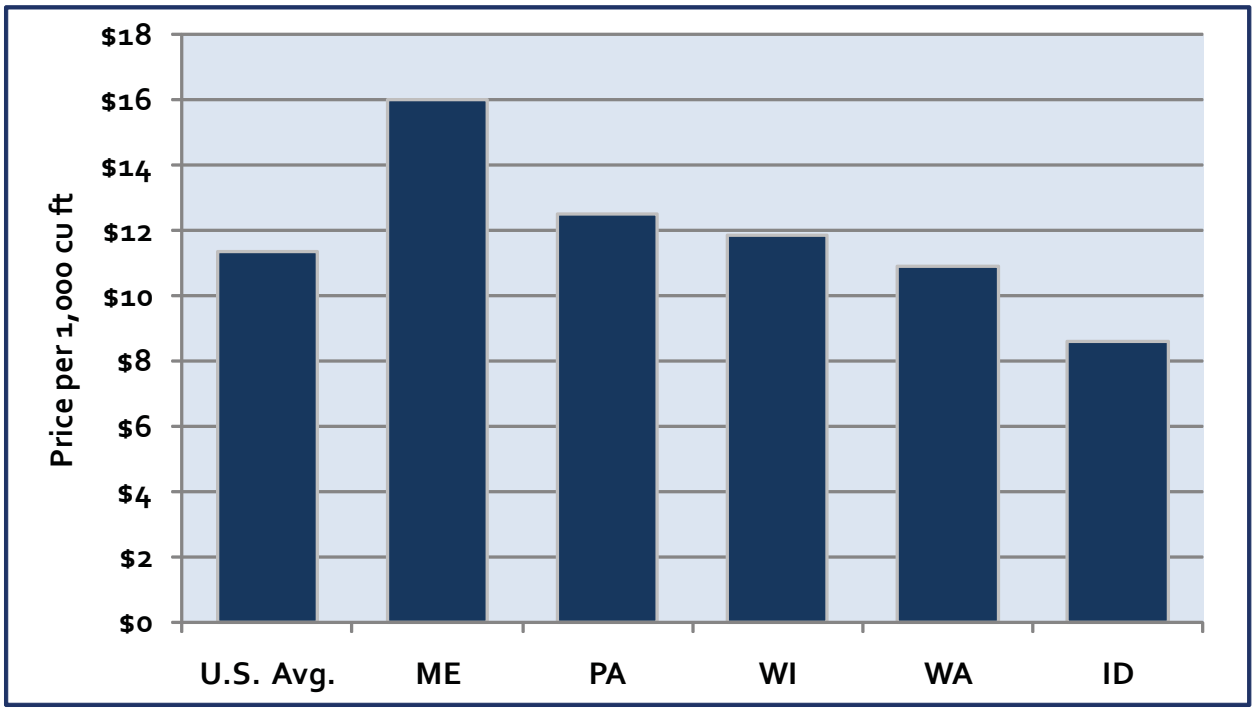
Other energy costs, such as diesel, natural gas, and heating oil, are also higher in Maine and New England than in other potato-growing regions. Figure 13 provides a comparison of natural gas prices in Maine with other regions of the country. Appendix 6 provides a detailed comparison of diesel fuel and gasoline prices. Higher energy costs contribute to the disadvantage that Maine potato growers face with their competitors.

The price of natural gas (figure 13) is an important consideration in selecting a site for potato processing and dehydration plants. It requires a minimum of 1,100 British Thermal Units (Btus) of heat energy to evaporate 1 pound of water. Potatoes are mainly water, averaging about 80 percent water and 20 percent solids. With an energy/heating value of 1,050 Btu per cubic foot, a minimum of 1 cubic foot of natural gas is required to remove a pound of water from any food product.

As a location for a large-scale potato processing facility, Maine has some advantages and some disadvantages. It is near large-scale potato production, low-cost land, and reasonable labor costs, but does not have access to inexpensive natural gas or electricity, limiting its ability to attract processing firms. The location of chipping facilities in Maine and Connecticut, frozen potato processing in Maine, and the recently upgraded frozen potato facility in New Brunswick shows the area is important to industry. However, other States and Provinces also desire such facilities, putting Maine in competition for them.

McCain Foods (the largest french fry maker in the world, claiming 33 percent of the global market, according to an analysis by Potato Pro[31]) is headquartered in Florenceville, New Brunswick (NB), a few miles from Maine, and has long been a factor in the Maine potato equation. It was major news in August 2000, when McCain announced the imminent construction of another french-fry plant in Easton, ME, near its current location.[32] It was mentioned at the time that McCain would receive a 90-percent rebate on taxes for 25 years to help offset the cost of the plant. In 2006, rebuilding of the Florenceville plant was announced, and in 2008 a new Florenceville plant opened.[33]

Figure 13. 2008 industrial price of natural gas



Source: EIA 2008 http://www.eia.doe.gov/oil_gas/natural_gas/info_glance/natural_gas.html

31 http://www.potatopro.com

32 http://www.mccain.com/Newsroom/FAQ/Documents/MediaRelease/MR_August_11_2000.pdf (PDF)

33 http://www.mccain.com/Newsroom/Announcements/Pages/Default.aspx

Interest in Maine as a location for processing is not exclusive to McCain. Lamb Weston, the largest potato processor in the world, took an option on 150 acres near Limestone, ME, in 2002, and again visited Aroostook County in 2008 to look at building sites. In a January 2009 interview, a spokesman for the Conagra subsidiary said it had been monitoring opportunities in Maine for 10 years and is always looking for production opportunities.[34]

McCain and Lamb Weston's interest indicates Maine has some serious potential as a location for a new french fry facility, but in the competitive environment for siting new potato plants, it is only one of a number of possible locations.

On the other hand, frozen french-fry processing facilities still fail to solve the problem of what to do with the off-grade and cull potatoes.

Processing

The limited market for low-grade and cull potatoes in Maine costs producers income and creates a waste management problem. Production of processed potato products, such as potato starch, flakes, and granules could create a market for the low-grade and/or cull potatoes sorted in Maine packing sheds. A facility to process cull potatoes would help Maine tablestock producers and improve their profitability. Maine and Pennsylvania are the only two Eastern States that have potato processing plants of any type. Besides french fry, chip, and frozen potato processing, Maine also has a small starch plant and Pennsylvania a large potato dehydration facility. In fact, many tablestock potatoes from Maine were being shipped to Pennsylvania for repacking and the cull potatoes processed into dehydrated potatoes in this plant. (A unique energy source—methane gas generated underground by an old landfill—allowed the plant to produce high-quality dehydrated product at a reasonable cost.)

Dehydrated Mashed Potatoes[35]

Generally made from cull potatoes, Russet Burbanks are most commonly used to manufacture dehydrated mashed potatoes because grading often eliminates as much as 50 percent of a Russet yield from being marketed as U.S. Number 1. The production of dehydrated mashed potatoes is a multi-step process in which potatoes are:

- Precooked and cooled
- Peeled by brushes
- Cooked again
- Mashed and dried

The resulting dried product has many uses in addition to instant mashed potatoes, including extruded food, snack food, animal feed, and as an ingredient in other food products such as ice cream, breading, and soup.

Dehydrated Potatoes

The processing differs slightly from that for dehydrated mashed potatoes because they are not cooked prior to processing. Instead potatoes are:

- Steam-peeled
- Trimmed to remove bad portions
- Diced or sliced
- Blanched, dried, and sorted (if pieces)
- Treated with sulfite (if sliced)

Diced products are used for canned food products, potato salad, hash-browns, and dry soup mixes. Slices (usually 3 millimeters thick) are used in retail and institutional casseroles and potato salads. Crushed or ground products are used in extruded snack pellets, as a thickener, in dumpling mixes and potato pancakes, and in dry soup mixes. Strips are used in restaurant hash browns.

Potato Flour

This traditional product is made from ground, dried potatoes. For centuries, it was a staple food, mixed with water to eat. Now it is used to improve texture and flavor in bread making, cookies, and candies. Potato flour may also be used as a thickener or breading agent.

34 Bangor Daily News January 8, 2009

35 Much of the following information on dehydrated potato products, flour, and starch is excerpted from Potandon Produce's "Green Giant" Web site at http://www.potandon.com.

Potato Starch

First produced in Germany in the late 1700s, it became popular in the United States by the late 1800s, but most plants producing it have since disappeared because it is difficult to dispose of potato starch waste. The competitive pricing of imported food-grade potato starch from Holland and Germany, where the industry is considered an integral part of potato production and receives government subsidies, is another factor. Consequently, there is only one conventional potato starch plant left in the United States —which is located in Maine—down from 21 in Maine alone as recently as 1962 (Treadway 1962). Conventional starch plants use whole potatoes and pieces to make starch.

However, starch modification plants that convert by-product starch generated in french fry and other potato processing facilities still exist in this country. The resulting starch is used primarily by the paper industry. This type of starch recovery reduces the cost of effluent waste treatment for the fry plants and this helps justify their operation. Zuckerforschung Tulln, an Austrian research firm, has an excellent online description of potato starch plants and how they operate.[36] The cell walls of the tuber are physically damaged, allowing the "juice" to be separated from the pulp. It is then dried to form a powder.

Because of the recent increase in the use of corn for ethanol production and other corn-derived ingredients, it is possible there will be a renewed interest in potato starch as a substitute for corn starch in the domestic market. An increase in the demand for potato starch has already occurred in the global marketplace, leading to the construction of new potato starch plants in several nations, especially China. Two new plants in China were under construction in 2008 by China Essence, which reported a 65-percent increase in income for the year ending in March 2008. The new plants are expected to increase China Essence's annual production of starch from 180,000 metric tons to 260,000 metric tons by 2010. In what is perhaps a related move, the Chinese government placed tariffs of between 17 and 35 percent on European starch entering the Chinese market (Partos 2008).

Plastics From Potatoes

Making plastics from potatoes has become one of the latest "earth friendly" concepts—replacing the oil-produced polyethylene films with plastic made of polylactic acids from potatoes. Polylactic acid (PLA) can be made from such plant starches as corn or potatoes. It is used to manufacture plastic films, resins, and fibers.

In June 2007, the University of Maine generated a short feasibility paper on the cost of producing PLA directly from potatoes in Maine (Dickerson and Rubin 2007). The paper reported that PLA could be produced from fresh potatoes, potato starch, or corn starch and that a plant located in Maine could produce PLA in usable amounts and at a price competitive with the pilot plant located in Germany. PLA-based plastic cups and films would be biodegradable, and could be composted in about 9 months in a home composting operation.

A Cargill subsidiary, Natureworks LLC, is the main U.S. producer of PLA for plastics. Natureworks makes PLA out of corn starch. Small plants in Japan, Europe, and China also produce PLA. A recent article in *Plastics Technology*[37] describes PLA as ready for commercial use; its only stumbling block is the price is not yet competitive with polyethylene. Depending on the direction of fuel costs and corn costs, the availability of low-cost potatoes as feedstock may eventually make PLA extracted from potatoes cost-competitive. The price target for competitive PLA is around $1 per pound; if that target is reached, PLA may be a viable industrial product.

36 Potato Starch Extraction. Zuckerforschung Web site. http://www.zuckerforschung.at/inhalt_en.php?titel=STARCH%20TECHNOLOGY&nav=nstaerkeinfo_en&con=cigs_en

37 http://www.ptonline.com

Are Maine Farmers Receiving Different Potato Prices Than Farmers in Canada or Idaho?

It is often suggested by members of the Maine potato industry that Maine potatoes are at a price disadvantage compared with potatoes grown in Maritime Canada or the Western United States. A typical comment is, "If only Maine could get the prices that growers in other areas receive." We decided to look at this issue and determine the validity of the premise that Maine potatoes are sold at lower prices than Idaho or Canadian potatoes.

Initially, we wanted as many comparisons as possible. We wanted to look at round whites, Russets, and red potatoes from New Brunswick, Maine, Wisconsin, and Idaho in the Boston, New York, and Baltimore Markets. However, because of the lack of data, reasonable comparisons could be made in these markets only for round whites and Russets from Maine, Canada, and Idaho.

Our investigation showed that Idaho producers receive a higher price all season long in most markets than Maine producers for Russet-type potatoes, but that Maine round white potatoes brought roughly the same price as Canadian or Idaho round whites, except in New York, where Maine round whites brought significantly lower prices.

To undertake the study, we relied on data collected by AMS Fruit and Vegetable Program Market News reporters at production points and urban wholesale markets. Fruit and Vegetable Program economists examined price data to determine if there were any consistent patterns of price premiums or penalties for Maine-origin potatoes compared with the same varieties of potatoes originating from other production regions.

Two tables were prepared from Market News price data showing the prices paid for potatoes from Maine compared with potatoes from competing sources. The types of potatoes selected for analysis were Russet Norkotah and Round White potatoes; data for other types of potatoes were too sporadic to make meaningful comparisons. For Russet Norkotah, the competing source for which price data were most readily available was Idaho. For round whites, Canada was the most representative competing source. All potatoes were grade Number 1, and the Canada Number 1 grade was assumed to be equivalent to U.S. Number 1 potatoes.

Price data were examined over a 7-year period, from marketing seasons 2001/2002 to 2007/2008. Average weekly prices were computed by averaging five daily prices; each daily price was the midpoint between the high and low price. Price differences were computed by subtracting the average weekly price for Idaho or Canadian potatoes from the Maine potato average price for each week in which both Maine and Idaho (or Canadian) prices for the specific grade, package type, and size were reported in the terminal market.

Round White Potato Prices

Overall, Maine round white potatoes received comparable prices in the Boston and Baltimore wholesale markets, but lower prices in New York. The number of weekly comparisons in different seasons ranged from 10 to 39. Averaged across each season, the average price difference ranged from a premium (higher price) of $1.23 for Maine potatoes (50-pound sacks) to a discount (lower price) of $1.29. On average, large-size Maine potatoes got $0.08 less per 50-pound sack than potatoes from Canada. Round white size A Maine potatoes yielded, on average, $0.23 less per 50-pound sack.

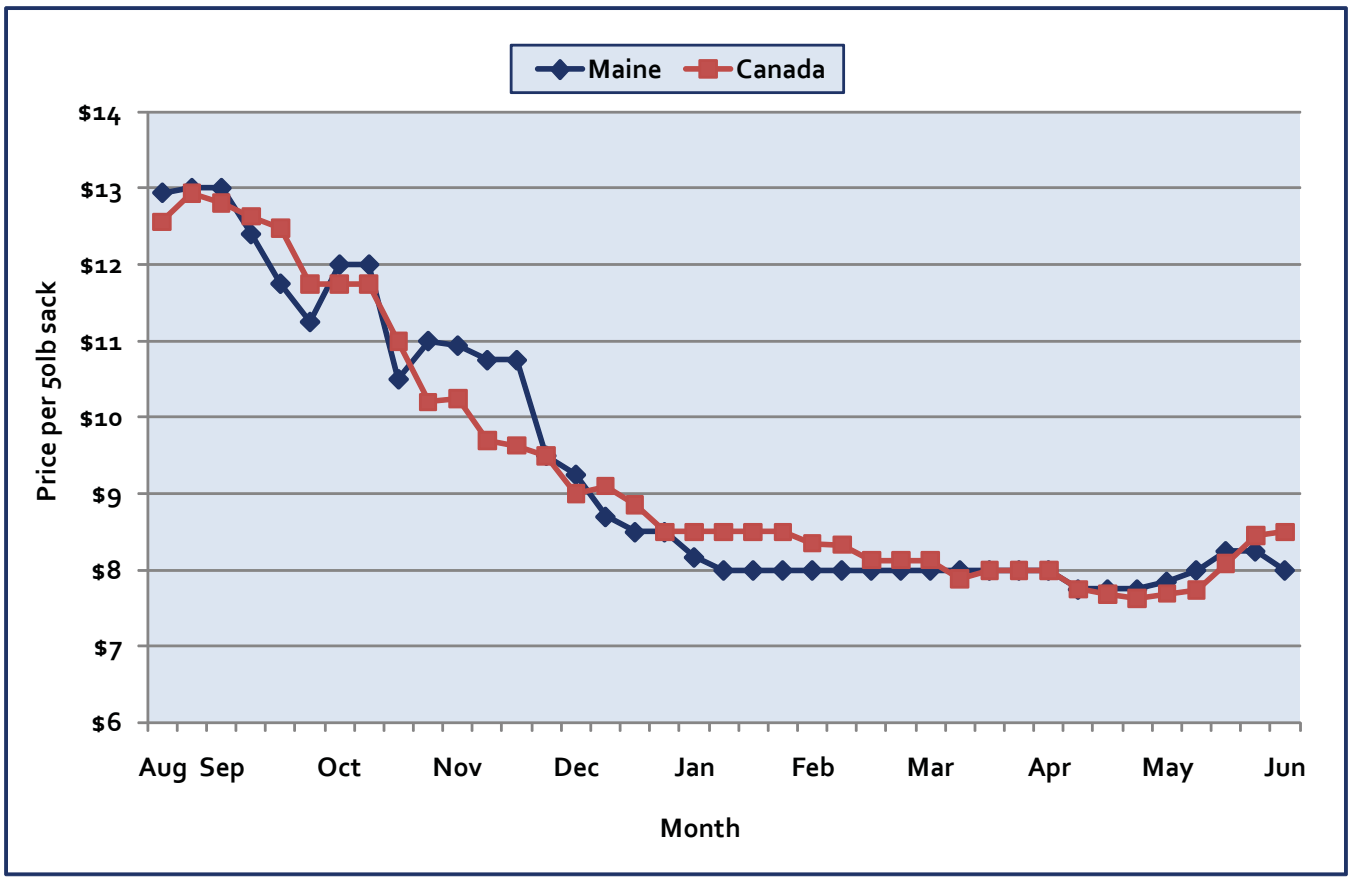
Figure 14 shows a typical year, 2006/2007, in the Boston market. For most of the season, the Canadian grown potatoes received a slightly higher price but, during November, the Maine potatoes received almost a dollar premium per 50-pound sack.

Less information was available for "baled 10-5 pound film bags, 2-inch minimum" round white potatoes sold in Boston. However, potatoes from Maine packed this way received on average $0.88 less per bale than the comparable Canadian potatoes. Over the seasons studied, Maine whites in baled poly bags were discounted an average of $0.33 to $1.19 per 50-pound bale from the same pack of potatoes from Canada.

For the Baltimore market, there were sufficient data for price comparisons for each of the seven seasons analyzed but, with price premiums in some years and price discounts in others, the average price difference between Maine and Canadian round white potatoes was close to zero. On average, buyers in Baltimore appear to value Maine and Canadian round white potatoes about equally.

Although much less data was available for the New York market (only 2 to 7 weeks per season), it appears that Maine round white potatoes were at a greater disadvantage in New York than in the other eastern wholesale markets; an average price discount of $1.09 was received relative to Canadian potatoes (50-pound sacks, Size A). Of the five seasons for which price comparisons were possible, the average of each season's largest price discounts for Maine potatoes relative to Idaho was $2.32 for round white number 1's in 50-pound paper sacks.

Figure 14. Boston (Quincy) Terminal Market—potato prices for Maine and Canadian Number 1 round white tablestock potatoes in 50-pound paper sacks, fall 2006–spring 2007



Source: USDA Market News http://search.ams.usda.gov/mnsearch/MNSearch.aspx

Russet Norkotah Potato Prices

Idaho received a higher price than Maine in most markets. The price differences for Russet Norkotah in all three terminal markets show Maine Russet Norkotah potatoes received substantially lower prices than Idaho potatoes. The price differences were considerably greater than the price differences between Maine and Canada round white potatoes. Based on four seasons with comparable data, with the number of weeks with measurable price differences ranging from 2 to 10 weeks, the average discount for Maine Russet Norkotah potatoes sold in Boston (baled 10 5-pound film bags, size A) was $3.67.

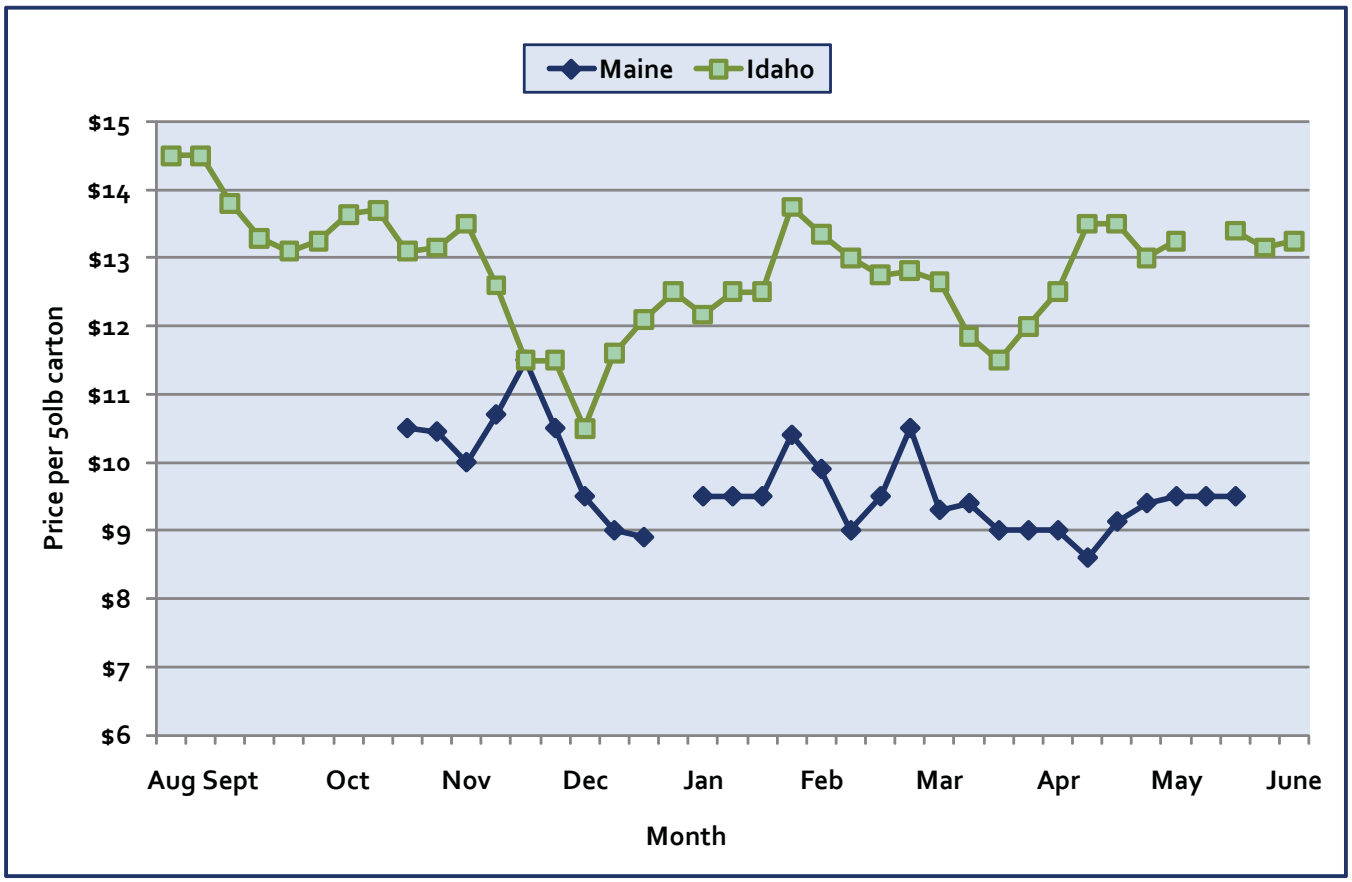
There were five useable seasons in both the Boston and New York markets (with the number of weekly comparisons per season ranging from 2 to 26) for which there were sufficient data to compute average seasonal price differences for Russet Norkotah potatoes (50-pound cartons of size 90). In the Boston market, the seasonal averages ranged from a premium of $1.36 for Maine potatoes relative to Idaho (in 2004/2005) to a sharply lower price ($9.40 discount per carton in 2006/2007). The overall average for the five seasons was a price discount for Maine potatoes of $3.69 in the Boston market when compared with Russet Norkotah potatoes from Idaho.

Note that in figure 15, during most of the 2006/2007 potato marketing year, Maine potato prices were considerably lower than Idaho's. In fact, in the New York market, the overall average of the five seasonal averages showed a price discount of $2.12 for 50-pound, 90-count cartons of Russet potatoes from Maine relative to Idaho potatoes. For large-size potatoes, the price differential was even greater, $3.44 per 50-pound carton. In the Baltimore market, in which there were only enough relevant data points on Russets for the 2007/2008 season, Maine-origin potatoes received, on average, $2.45 less per 50-pound, 90-count carton when compared with Idaho Russets.

Why did Russet potatoes from Idaho have such a superior position in the marketplace? In the absence of definitive information, it is difficult to speculate, but four factors emerged as possibilities from conversations with wholesale dealers:

- Superior market promotion
- Larger sizes
- Better grading and condition
- Better packaging

Figure 15. Russet potato (50 lb) prices in the New York Wholesale Market, 2006/2007, for potatoes shipped from Maine and Idaho



Source: AMS Market News http://search.ams.usda.gov/mnsearch/MNSearch.aspx

Market Promotion Programs

As an introduction to an exploration of potential new marketing directions for Maine fresh potato growers, we examined successful marketing strategies and promotion programs being undertaken by different segments of the U.S. potato industry, and evaluated the relevance of these programs to the Maine marketing situation. After conducting a broad literature search of potato marketing activities, we decided to focus on the following critical issues:

- National marketing programs
- Category management
- Potato repackers activities
- Grower-shipper roles
- Effectiveness of State and regional branding/ promotion efforts
- Cooperatives and their marketing programs
- Effectiveness of supply management
- Maine's support of its potato industry compared with efforts elsewhere

National Marketing Programs

The United States Potato Board (USPB) was established in 1971 by potato growers to promote the eating of potatoes. Through a consumers' Web site (http://www.healthypotato.com) and a producers' Web site (http://www.uspotatoes.com), USPB offers public relations, nutrition education, retail programs, foodservice marketing, and export programs to educate consumers, retailers, and culinary professionals about the convenience, good nutrition, and versatility of potatoes.

The USPB actively educates health care professionals, the media, and consumers about the dietary value of the vitamins and minerals found in potatoes, including the refrain "potatoes have more potassium than a banana." Posted below are some of the more prominent advertising logos (figure 16). The phrase "We're here to help" refers to the support the U.S. Potato Board provides to members of the U.S. potato industry, especially marketers.

Mac Johnson of the U.S. Potato Board has performed a variety of research and analyses on marketing potatoes. His work shows there may be some market flexibility in increasing the price of potatoes at the retail level due to the relative inelasticity in consumer demand, the lack of consumers' familiarity with potato prices, and low prices for potatoes compared with other vegetables and substitute goods.

USPB prepared a lengthy marketing toolkit[38] for "reinventing" the potato that answers questions such as:

- Who are the consumers?
- What sort of products they are looking for?
- What price levels do they require?

The toolkit also has information on the low calorie count and high vitamin content of potatoes.

The USPB also offers a *Guide to Category Management of Potatoes*. Much of the Board's research information is online at http://www.uspotatoes.com/271research.html

POTATOES GOODNESS™ UNEARTHED
45% Daily Supply of Vitamin C | Naturally Fat Free | Full of Vitamins and Minerals

UNITED STATES Potato BOARD
Maximizing Return on Grower Investment

38 http://www.uspotatoes.com/downloads/Reinventingthepotato.pdf (PDF)

Category Management

Category management is a watchword in potato marketing today. It is defined very well on the USPB site as a way for potato suppliers to more effectively work together with retailers to manage and sell the entire category of potatoes, not just a single potato variety or brand. Its basic assumption is that profits to both buyers and sellers can be increased through carefully examining customer needs, sales and scanner data, product selection and display, and advertising and promotion, and sharing the results with suppliers. When wholesalers and retailers provide these services, and suppliers are sensitive to real-time customer data, all can share the benefits from increased retail sales.

Category management strategies are being employed by growers-shippers, repackers, private label manufacturers, and farm cooperatives. Whatever their particular business arrangements, each organization is using a well-thought-out plan to provide:

- The types of potatoes desired by retailers
- Attractive packaging
- Consistent high quality
- Available as closely as possible to year-round

The USPB has developed information on how to implement portions of a category management strategy that includes suggestions for product selection and variety, store placement, pricing, and in-store promotion.

Potato Packers and Repackers

Potato packers and repackers have been in business for many decades, but the size and scope of services they provide today has expanded. In today's marketplace, packers and repackers receive previously washed and graded potatoes in 2,000-pound totes, which they then regrade and pack to suit specific customer demand.

There are several reasons why repacking potatoes remains an important intermediary function in the supply chain:

- Potatoes often sustain damage from vibration or compression during shipment, requiring damaged tubers be removed.
- New potatoes from Florida, Virginia, Delaware, California, and other areas are highly susceptible to bruising and often are repacked before sale.
- Many repackers want to fulfill most, if not all, of the potato needs of a customer, which requires them to provide customized packing services.
- Customers want to deal with as few suppliers as possible, and large potato packer/repackers are able to source potatoes from across the country and, on a nearly year-round basis, provide potatoes of uniform size and quality.

Potato repackers, such as Masser Potato Farms (PA), Bushwick (NY), Hapco (NY), and Russet Potato Exchange (WI), source potatoes both locally and from around the country. Figure 17 shows the wide variety of potatoes, colors, and packaging available from repackers such as Masser.

Figure 17. Repackers provide a wide variety of potatoes year round[39]

39 Photos courtesy of Masser Potato Farms http://www.masserspuds.com

Masser offers nearly all popular varieties of fresh potatoes consumed in the United States—Russets, round whites, reds, fingerlings, and Yukon Gold. They come packaged in paper, polyethylene bags, individually wrapped microwavable packages, and in clamshells, and are available in 1-, 5-, 10-, and 50-pound packages, either U.S. Grade 1 or 2 (unclassified).

Masser and the large repackers use attractive color-coded packaging as a marketing tool to increase consumer awareness of the different potatoes available, and thereby increase retail sales.

Like Masser Produce, the Russet Potato Exchange (RPE)[40] uses category management as a marketing strategy. RPE has a state-of-the-art facility in Bancroft, WI, that markets a full line of high-quality potatoes in the eastern and midwestern markets. Among the full line of potatoes is an extra-large Russet potato named "Biggins" that is marketed both as singles and in polyethylene bags.

Figure 18. Some of Russet Potato Exchange's potato offerings[41]

Biggins

Mr. Tasty

Naturally Nutritious

Disneygarden

40 http://www.rpespuds.com

41 http://www.rpespuds.com

Green Giant Fresh[42] is the largest seller of fresh tablestock potatoes in this country and, with a Canadian partner, in Canada. It is not part of the food processing firm Green Giant, but negotiated the use of the brand name to market potatoes.

The organization is growing so rapidly it is difficult to count the firms and cooperatives it currently represents (at least six) or how many acres of production it manages (at least 26,000). Green Giant Fresh is one of the few national potato brands that always identifies potatoes by variety and State of origin.

Figure 19. Green Giant Fresh branded potatoes are identified by variety and place of origin (Idaho)

Source: Green Giant Fresh

Figure 20. Green Giant Fresh brand baking potatoes have become a fixture in many U.S. grocery stores

Source: Green Giant Fresh

42 http://www.greengiantfresh.com/

Grower-Shippers

Grower-shippers are producers that ship their own crops to market. There are many such producers in Maine and in other potato-growing areas of the United States. Not only do they grow, store, pack, and ship potatoes but, as they become larger, some begin packing and marketing potatoes for other farmers. One leading grower-shipper in the U.S. potato industry is Idaho's Larsen Farms.[43] Started in 1970, Larsen now encompasses 40,000 acres, operating in Idaho, Nebraska, and Colorado. The largest potato farm in the United States, Larsen is now a vertically integrated operation that grows potatoes, harvests, packs, markets, and ships fresh and dehydrated potatoes around the world. Larsen owns and operates the entire operation, from growing seed potatoes and owning its own dehydration plant to operating its own fleet of delivery vehicles and repacking facilities in cities around the country.

Grower-shippers have several marketing advantages over standard producers, insofar as they are able to eliminate one layer of marketing costs, have direct contact with grocery chain buyers, and maintain more control over the quality of the product that customers receive. However, they do face some greater marketing challenges, as well. By definition, grower-shippers bear the costs and problems associated with operating a packing facility and maintaining a marketing and logistics staff to pack, market, and deliver potatoes. Furthermore, in the face of increased levels of concentration in the U.S. retail food industry, many of these grower-shippers have been obliged to expand their volume of business activity in order to satisfy customer demands Given their limited access to capital, most tablestock potato producers in Maine, primarily smaller scale growers, do not have the option of expanding their production, and thus may be left out of many markets unless they band together in some fashion with other producers.

43 http://www.larsenfarms.com

State Branding and Promotion Programs

Many States have implemented State brands for their agricultural products, including potatoes. In some of the large potato-producing States, branding and State marketing programs have been undertaken by State departments of agriculture, commodity marketing boards, and private firms.

The Idaho Potato Commission has long had a serious and effective campaign to market Idaho® potatoes to consumers, particularly Russets. As a result, Idaho has become well known as a geographic area where Russet baking potatoes are grown.

In Pennsylvania, the "Pennsylvania Preferred" program[44] is a Department of Agriculture program that identifies producers of agricultural products "substantially grown or manufactured in Pennsylvania using Pennsylvania farm items." Many potato producers and repackers in the State use the "Pennsylvania Preferred" logo to market as a "locally grown" supplier.

Figure 21. State branding logos

Other States, including Colorado and Washington, sponsor marketing and grower assistance programs for their potato growers. One of the most prominent is the grower assistance program in Washington that provides State and Federal support for a fleet of railcars that could be used by the potato industry to move product to Eastern markets.[45] (This and other rail transportation issues are discussed in more detail in the transportation section on page 44.)

Cooperatives

One question asked by Maine farmers was, "Are there any successful potato grower marketing cooperatives?" Fortunately, we can report that there are successful potato marketing cooperatives across the United States that help farmers market their crops with several different strategies. Some of them market potatoes collectively under the cooperative's name, others also operate their own packing facilities, and still others concentrate principally on sales staff to sell potatoes packed independently by individual cooperative members. A handful of potato marketing cooperatives even use the powerful tool of "supply management" to keep prices at a profitable level for growers.

United Potato Growers is a cooperative under U.S. law. Its operation and those of its affiliated state and Canadian organizations are described in a following section "Supply Management Strategies."

44 http://www.agriculture.state.pa.us/papreferred/site/default.asp

45 Senator Patty Murray Discusses Rail Car Pool. Chef2Chef Web site. http://chef2chef.net/news/foodservice/Press_Releases-Associations/Senator_Patty_Murray_Discusses_Rail_Car_Pool.htm

Some important potato marketing cooperatives in the United States:

- Associated Potato Growers, Grand Forks, ND[46]
- Basin Gold Cooperative in Pasco, WI, markets potatoes and onions for Oregon and Washington producers.[47]
- Center Potato Growers Cooperative, Center, CO, and Saginaw Bay are exporters of U.S. potato products.
- Chief Wabasis Cooperative[48] is a potato grower cooperative of modest size in McBride, MI. It has a relationship with the Pro Fac cooperative that supplies vegetables to Birds Eye Foods.
- Kern Produce Shippers Association, Irvine, CA, which represents nearly 15,000 fresh potato acres and 20 growers
- Maine Potato Growers, Presque Isle, ME
- Newell Potato Cooperative Inc., Tulelake, CA
- Pennsylvania Co-Operative Potato Growers,[49] Harrisburg, PA, is a "non-profit organization serving as a vital link between the State's potato growers and buyers."
- Saginaw Bay Potato Cooperative, Munger, MI, markets "new" fresh summer potatoes, mainly the Onaway variety, marketed fresh from the field in early July.
- Southern Idaho Potato Cooperative (SIPCO), Meridian, ID, founded in 1997, is the bargaining unit for Idaho potato growers producing for the frozen processed market.
- Sun Fresh of Florida Marketing Cooperative[50] is a six-grower cooperative that markets SunLite™ all-natural, low-carbohydrate potatoes. It is located at the Blue Sky Farms packing facility in Elkton, FL.
- Sun Valley Potatoes[51] of Paul, ID, claims to be the only grower cooperative in Idaho that owns and operates its own packing and marketing facility.

Figure 22. Logos for some of the important U.S. potato marketing cooperatives – Sun Valley (Idaho), Basin Gold (Wisconsin), Chief Wabasis (Michigan) and Maine Potato Growers

46 http://www.apgspud.com/aboutus.htm

47 http://www.basingold.com

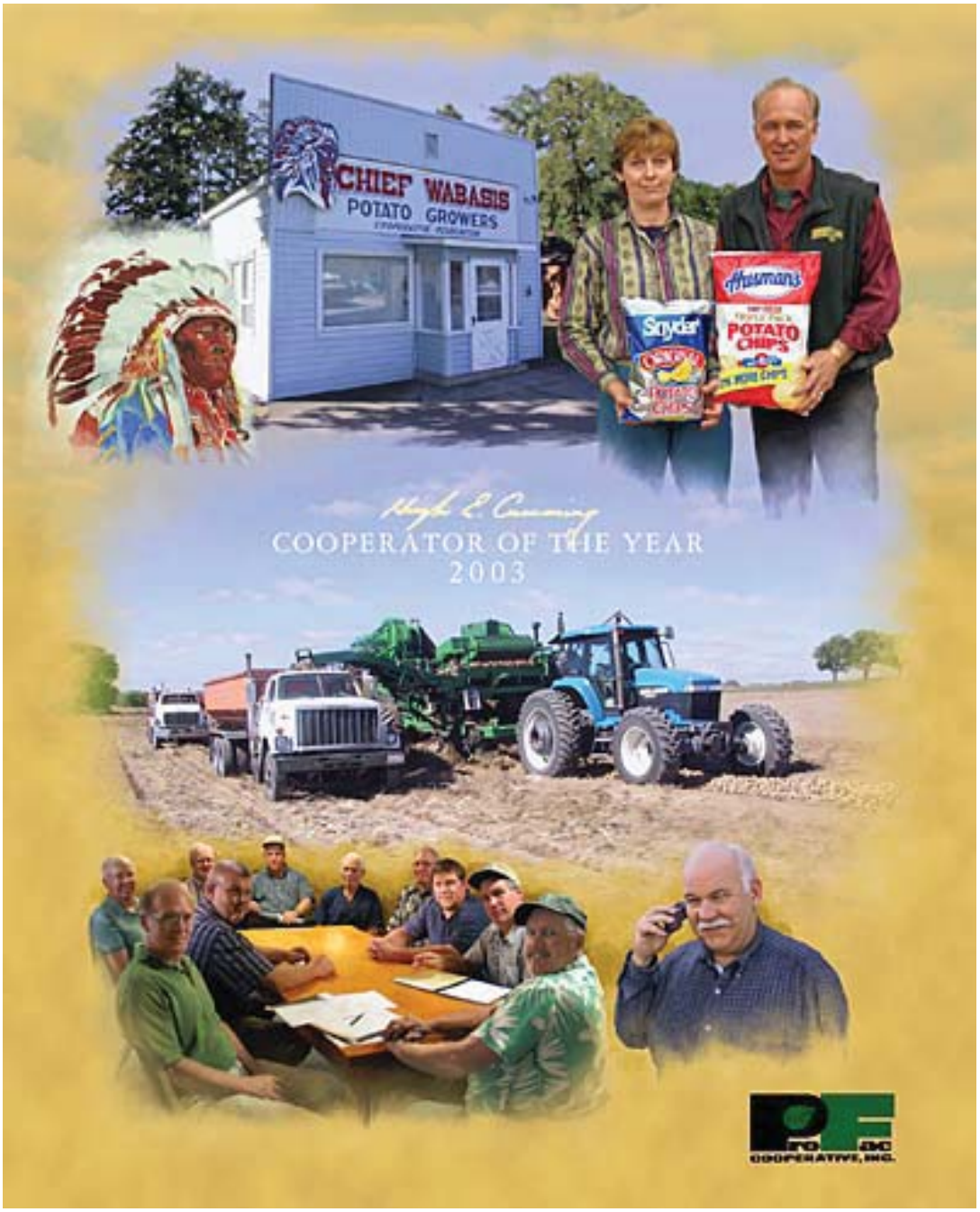
48 http://www.chiefwabasis.com

49 http://www.pacooppotatoes.com

50 http://www.sunfreshofflorida.com

51 http://www.idaho-potatoes.com

Figure 23. Chief Wabasis Potato Cooperative of Michigan received a Cooperator Award from the large Pro Fac Cooperative, headquartered in New York



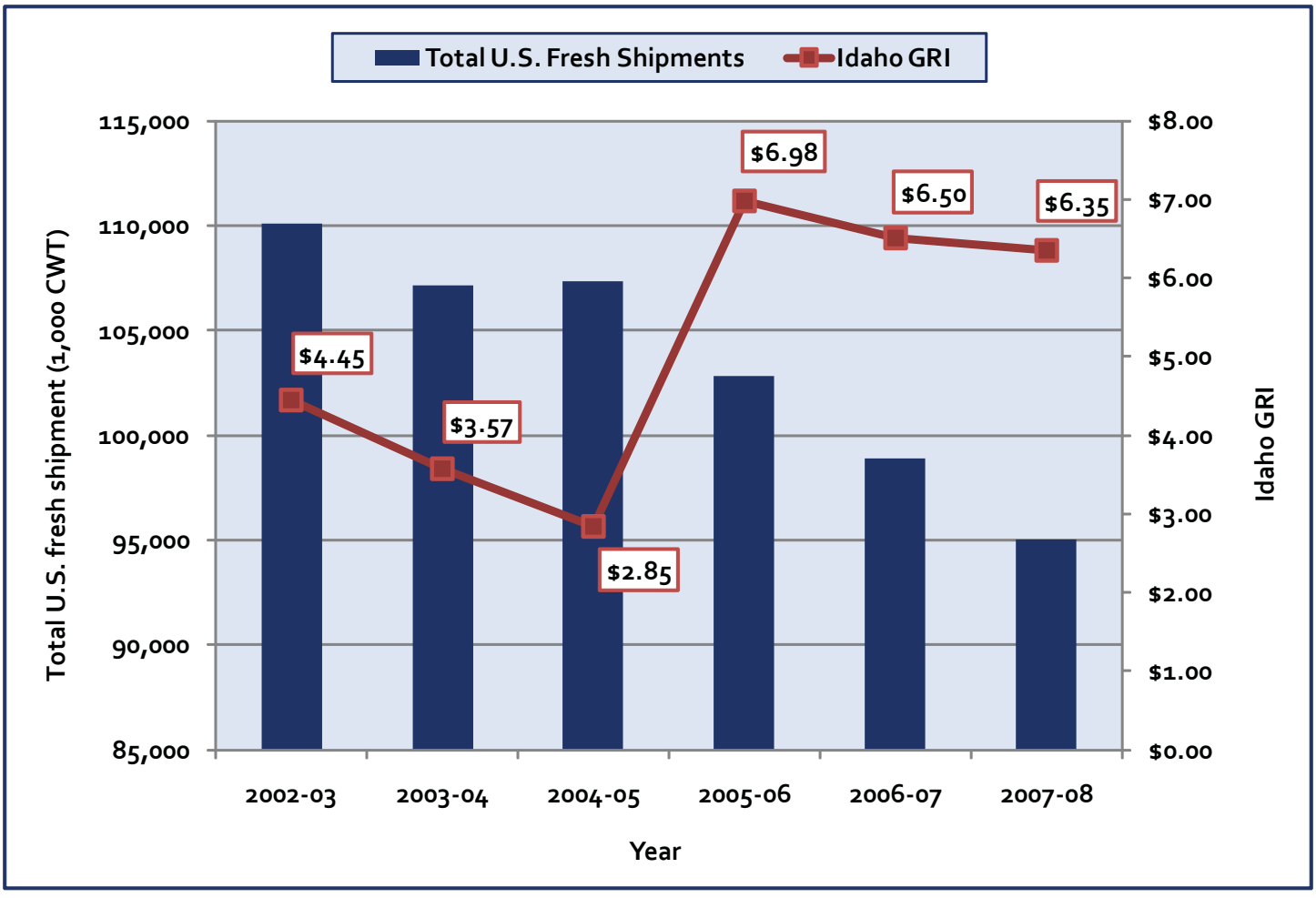
Supply Management Strategies

Supply or acreage limitation strategies are used by United Potato Growers of America (United),[52] United Potato Growers of Canada, and some smaller groups (Potato Growers of Idaho and Red River Valley Potato Producers Cooperative). These potato growers' cooperatives represent the majority of potato acreage in the United States and Canada. Currently, neither Maine nor Michigan participates in these programs.

To enhance grower returns, each group employs several strategies, including marketing data and intelligence and reducing acreage. Acreage reduction is based on projected harvests, prices, and need. Growers who voluntarily reduce acreage below a predetermined historical average are paid around $200 for each acre removed from production.

A graph from United's Web site (figure 24) illustrates claims of how grower profitability has increased since the inception of its potato marketing strategy. In 2004/2005, the profitability of growing potatoes had dropped significantly, illustrated by the red grower-return line with a value of $2.85 for the 2004/2005 crop year. At the same time, total U.S. shipments were up to 107 million hundredweight, illustrated by the blue bar with a value of 107,368. As the chart shows, after United instituted an acreage program reduction of 5 million hundredweight in 2005/2006, the grower return index more than doubled to nearly $7.00.

Figure 24. U.S. fresh potato shipments by year, with the Idaho grower return index (GRI)



Source: Potato Growers of America[53]

52 www.unitedpotatousa.com

53 http://www.unitedpotatousa.com

Marketing Strategies Used in Maine for Tablestock Potatoes

The Maine Potato Board and the Maine Department of Agriculture are the principle organizations assisting farmers marketing Maine tablestock potatoes. The Agricultural Bargaining Council[54] represents Maine potato growers and negotiates prices with the processors. Their efforts are supported by Maine Cooperative Extension, University of Maine, and ARS. Indirectly, tablestock producers are aided by McCain Foods in efforts to improve potato quality for processing potatoes. AMS[55] provides potato price and marketing data, inspection services, third-party auditing services for good agricultural practices (GAPs), and technical assistance.

Bag and Label

The Maine Potato Board and Maine Department of Agriculture have developed a generic "Maine" white paper window bag for potatoes. A "get real, get Maine!" label is also available to producers of all agricultural products grown in the State, targeting both the consuming public and food retailers (figure 25).

Figure 25. Maine's "get real, get Maine!" logo

Higher Grade Standard

Maine assists tablestock growers by implementing a Maine Number 1 Grade that maintains higher standards of quality than U.S. Number 1 Grade for potatoes shipped out of State. It also publicizes this higher grading standard. (Anecdotally, we were told not all potatoes leaving Maine are graded to this standard.)

Improved Storage and Handling

The State of Maine helps fresh potato growers by loaning money for potato storage at very low rates. The program, The Potato Marketing Improvement Fund (PMIF),[56] provides financing to Maine potato growers and packers to construct new storages, modernize existing storages, and purchase packing lines. PMIF is part of the industry's plan to improve the quality and marketing of Maine potatoes. It provides long-term, fixed-rate loans at low interest rates for the construction of, or improvements to, storage and packing facilities. Funds cannot be used for working capital, refinancing, or non-project-related equipment. PMIF funds may be used only for permanent financing after a project is completed. The Potato Marketing Improvement Fund consists of two programs: Storage Retrofit Fund and the New Facilities Fund, so both new and existing facilities are eligible for financing.

McCain Assistance

McCain indirectly assists tablestock growers by providing engineering and technical assistance to encourage the construction and proper operation of improved storage facilities and packing lines, which can increase efficiency, reduce losses, and improve product quality.

Potato Dealers

Maine potatoes have been marketed through a dealer system for more than 100 years. Many Maine tablestock potato marketers are well known. Some heavily involved in selling potatoes grown and packed in Maine include the following:

MPG Fresh is the marketing division of the Maine Potato Growers Cooperative (MPG)[57] based in Presque Isle, ME. MPG mainly serves as a purchasing cooperative for inputs for Maine potato farmers. However, the Fresh Division does sell a limited amount of their members' tablestock potatoes and is interested in expanding that part of its business.

Figure 26. Maine Potato Growers logo

54 http://www.pmana.org/abc.htm

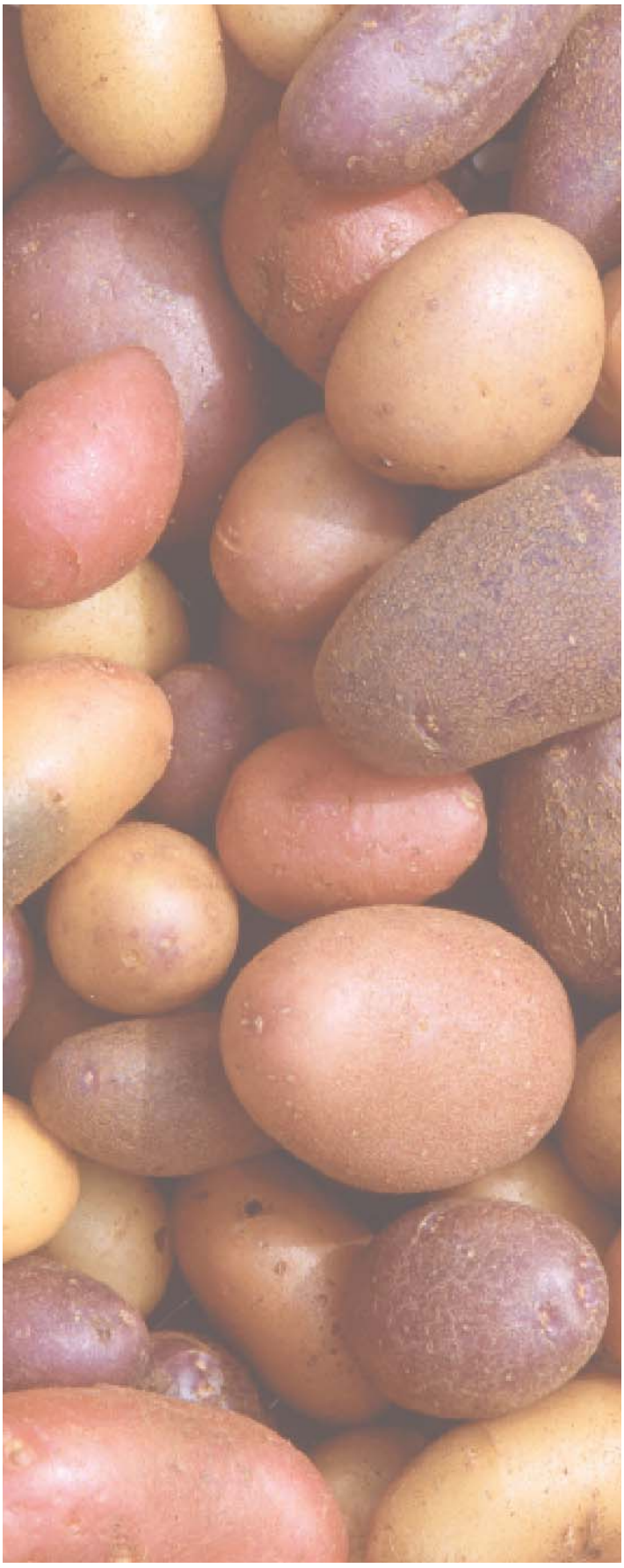
55 http://www.ams.usda.gov

56 http://www.state.me.us/agriculture/mpd/business/pmif/index.html

57 http://www.mpgco-op.com/potatoes/index.html

H. Smith Packing and Smith Farm of Presque Isle is known nationwide as a progressive grower and marketer of quality broccoli and potatoes. The company ships potatoes from Maine and Florida and broccoli from Maine. Potatoes are sold under several labels including the well-known *Stag* brand.[58]

Guerrette Sales of Caribou, Maine, along with Bushwick Commission Company, brokered a deal with Wal-Mart to sell Maine Potatoes and support the "get real, get Maine!" program.



What Improvements Could Be Made?

Maine has only a meager budget to finance tablestock potato marketing strategies; these funds could be applied to develop a marketing organization that:

- Employs a unified, joint marketing strategy, probably through a cooperative or other formal marketing structure. Pooling resources, both potatoes and capital, could help growers increase returns and/or volume of potatoes marketed.
- Hires professional sales staff dedicated to moving Maine potatoes. Sales staff who sell potatoes from competing areas during the same marketing season will not benefit Maine producers.
- Adopts the "buy local" movement by employing marketing strategies that identify the product as local and regional (Maine) and includes the ideas of the healthy land, air, and water in Maine.
- Increases the diversity of potato sizes, colors, and varieties, with packaging and promotion to match.
- Improves packaging to make it part of the selling strategy. Includes more Maine-inspired themes: pine trees, healthy air and water, farmer stories, etc.
- Maintains the high quality of potato production so customers would be more than satisfied with the size and quality of Maine potatoes. Financial incentives, such as those currently used by potato processors to encourage quality, could be employed to induce growers to maintain high standards.
- Seeks or develops markets for unwanted lower grade potatoes, including dehydrated flakes, meal, plastics, and starch. A commitment to quality will increase the need for markets for lower-graded potatoes.
- Works to improve existing rail and water transportation systems to lower shipping costs to major East Coast markets.

These marketing, production, and logistical solutions have been successfully applied in other production areas. They may not all work in Maine, but some can be adapted to Maine's unique situation.

58 http://www.smithsfarm.com/fresh_produce.asp.

Quality and Postharvest Handling of Maine Potatoes

Larger, higher quality potatoes with superior appearance generate, as one might expect, higher prices in the marketplace. Potato quality is most strongly influenced by variety, followed by such environmental and growing conditions as weather, soil texture, and fertility. Other factors include disease-free seed, a deep seedbed, proper soil pH, freedom from disease and insects, adequate heat and moisture, and sufficient fertility. The timing of rain and the use or lack of irrigation are important. Rain during the growing season is good, but rain during the harvest tends to impede tuber quality.

Improving Quality

The quality of Maine potatoes could be improved by:

Using the Finest Soils

Appearance is vital for tablestock potatoes. Fine-textured soils with few rocks produce the most attractive potatoes with the fewest blemishes. The best soils should be reserved for tablestock potatoes. Coarser and rockier, but otherwise productive, soils should be used for processing and seed potatoes, where minor cosmetic defects are of less importance.

Irrigating

In the past, consistent rainfall allowed good yields and generally made the purchase of expensive irrigation systems uneconomic. Today, long-term weather trends indicate that Maine can expect drier growing seasons and wetter winters. Potatoes need ample water during the growing season, and it makes sense to irrigate the fields with fine soil to grow the cosmetically desirable tablestock potatoes the market demands. Where sources for irrigation are scarce, water may be stored during the rainy winter season for use during the growing season.

Preventing Bruises

Maine Extension's bruise-prevention program for fresh potatoes is a model for the Nation. Bruising may be caused by dropping more than a few inches, landing on hard surfaces, vibration during transport, or piling too deep. The damage from rough handling may not become apparent until later—in storage, or after the potatoes are sold. A research/education program to control potato bruising will help continue improve potato quality.

Improving Storage

Potatoes in Maine generally spend some time in storage before being shipped. Although many storage structures have been built or improved in the last 20 years, not all meet the high standard needed to ensure the highest quality potatoes are being shipped. Storage facilities should ensure proper ventilation with appropriate temperature controls to maintain the best storage temperature of the potato pile. Properly sized variable frequency drive (VFD) fan motors allow the fan speed to be altered automatically, allowing the most energy-efficient operation of the ventilation system. With Maine's high electrical rates—which will probably climb yet higher—VFDs are a wise investment. Excessive ventilation may lead to overly cooled potatoes in winter or to moisture loss. Low ventilation rates or poor air distribution cause "hot spots" and spoilage. Proper placement of ductwork in the pile allows good distribution of air to all tubers in storage.

Traditionally, refrigeration has not been employed in potato storage to control climate. However, refrigerated storage facilities may be useful, especially in repacking operations where potatoes have been washed and dried with heat. The benefits must be weighed against the increased energy costs. Large repacking operations, such as those employed by RPE in Wisconsin and Masser in Pennsylvania, use state-of-the-art refrigerated storage facilities to keep potatoes at optimum temperatures after washing and grading regardless of outside conditions. Such refrigerated storage would allow Maine producers to lengthen the period for the highest quality potatoes.

Improving Washing and Drying

Almost all tablestock potatoes in commerce today are washed before they are sold. This was not true in Maine a short time ago, when unwashed tablestock potatoes were sold. Unwashed potatoes were believed to keep better in storage, which may, in fact, be true, as microbial spoilage is enhanced at higher moisture levels. However, the marketplace now requires washed potatoes.

In Maine, washed potatoes are dried with sponge drying rollers. In modern facilities in other parts of the United States and Canada, washed and sponged potatoes are dried further with heated air. Warmed potatoes need cooling, which is accomplished with ventilation air or refrigerated air. Potatoes that are air-dried and cooled have a longer shelf life than those put in storage either warm or slightly wet. Future high-end repacking facilities should have equipment for washing, roll drying, heated air drying, and refrigeration.

Packaging

Consumer packaging for potatoes has several purposes beyond only preventing the potatoes from rolling around. It protects the potatoes from physical damage, shades them from damaging sunlight, and supports advertising, identification, and portion control. Five- and ten-pound paper and polyethylene bags are popular retail packaging for most potatoes. Smaller bags and clamshells are most often used for specialty potatoes. Many buyers require the greater volume and lower unit-cost of 50-pound paper sacks.

To make potato packaging more consumer-friendly, some larger firms in tablestock potato marketing, such as Green Giant, Masser, and RPE, use colorful packaging to entice retail buyers and consumers, describe the distinctive characteristics of their products, and differentiate their potatoes from generic commodities. This is a first step to enhance buyers to purchase Maine potatoes through attractive packaging. Adding graphics showing popular images associated with Maine itself—old fashioned Yankee values, lobsters, canoes, moose, clean air and water, pine trees— could generate appeal, if used properly, as could popular potato-related images such as Hasbro's Mr. Potato Head. Other ideas for innovative packaging might include:

- Single potatoes marketed for cooking in the microwave
- Recipes and storage tips
- "Homespun" stories about the farmers who raised the potatoes
- Photos of farms and farmers

Telling farmers' stories through packaging and point-of-sale materials has been a real boon for many locally grown products sold on retail shelves in recent years; adding some of those elements to potato packaging and displays could probably boost retail sales and brand development/loyalty. Examples of such ideas can be found in the AMS publication, *Supply Chain Basics: The Dynamics of Change in the U.S. Food Marketing Environment* (Tropp, Ragland, and Barham, 2008).

Preventing Damage

Insects, nematodes, and disease organisms can damage tubers directly, or indirectly, by sapping the strength of the growing plant. Some of the more important problems that reduce the marketability of potatoes include:

Early Blight	Common Scab
Late Blight	Silver Scurf
Wilts	Greening
Black Scurf	Hollow Heart
Black Leg	Golden Cyst Nematode
Soft Rot	Potato Cyst Nematode
Dry Rot	Colorado Potato Beetle
Ring Rot	

Preventing these diseases and eliminating pests requires good agronomic practices, appropriate spray materials, crop rotations, proper storage, effective use of quarantine measures, and a bit of luck. Engaging in risky activities, such as acquiring used farm equipment or seed potatoes from areas with disease or pest problems, is counterproductive. Protecting Maine's potato industry from potentially disastrous outbreaks should be of prime concern to Federal officials, potato seed and equipment suppliers, and all farmers in the State.

Logistical Challenges and Opportunities

Maine—especially Aroostook County—encounters difficulties in accessing densely populated urban markets in the Northeast, despite being located in the Northeast. Examination of Table 2 shows how far Aroostook County is from major markets. Hunt's Point in New York City is 600 miles away, Boston is 400, Baltimore, 800, and Philadelphia, 700. Maine's competitors in Harrisburg, PA, are closer to Boston than is Presque Isle!

Truck Transportation

Over time, the inherent flexibility and low cost of trucking has allowed trucking to supplant rail for moving Maine potatoes to Boston, New York, Philadelphia, Baltimore, and Washington. However, fuel costs and other factors—such as truck shortages and lack of backhaul opportunities—have pushed up trucking costs. Transport by truck from Presque Isle to a major customer in Central Pennsylvania was $80 per ton ($4.00 per hundredweight) in 2007, nearly equal to the price paid to farmers for the potatoes. Transportation was roughly 45 percent of the cost of the raw product.

AMS *Fruit and Vegetable Market News*[59] reported in 2007 that Maine potatoes encountered fuel surcharges of 9–18 percent, in addition to the base shipping rate, to major destinations. In the second half of the 2007 shipping season, fuel surcharges reached 18 percent.

Table 2 contains truck shipping costs from Maine to its major markets. Farmers in northern Aroostook County told us in 2007 that an additional 25–50 cents penalty for moving potatoes out of the St. John's River Valley was regularly added per hundredweight. This additional cost was not included in table 2.

Table 2. Distance, time, and estimated cost for transporting Maine potatoes to various eastern markets by truck

City	Distance/Time	Base Cost (per hundredweight)	Price with fuel surcharge
Boston	390 miles / 6.5 hours	$2.40	$2.60 - $2.83
New York	600 miles / 10.0 hours	$3.00	$3.27 - $3.54
Philadelphia	700 miles / 12.0 hours	$3.50	$3.82 - $4.13
Baltimore (Jessup)	800 miles / 13.5 hours	$3.75	$4.09 - $4.43

Source: AMS F&V Market News (2007) and Google Maps

59 http://www.ams.usda.gov/AMSv1.0/getfile?dDocName=STELPRDC5067295

Rail Transportation

Rail moves many potatoes in the United States. With recent fuel price increases, the cost savings afforded by rail compared with trucks may offset its lack of flexibility. Other issues, however, must be considered: service, reliability, and the availability of refrigerated railcars.

The number of refrigerated railcars in service in the United States dropped from an all-time high of 183,000 in 1930 to a low of 8,000 in 2001. Since then, the number of refrigerated railcars has rebounded to 25,000. Transport availability is often a problem during busy shipping seasons, so some shippers in Washington State now have access to State-purchased railcars dedicated to moving potatoes (see Railcars in Other States on page 47).

In 2006, United States Railroads:

- Carried 18,782 railcars of potatoes
- Originated 9,723 railcars of potatoes
- Carried 1,165,179 tons of potatoes
- Carried about 62 tons of potatoes per average railcar
- Generated $69,088,669 in revenue from potatoes—about $3,678 per railcar[60]

Rail Movements of Potatoes from the Northeast

Extrapolation of 2005 waybill sample data reveales that about 520 carloads (11,200 tons) of potatoes were hauled by rail from the northeastern[61] States in '05, with most destinations in the upper Southeast.[62]

What is a Waybill?

A waybill is a document issued by carriers containing details and instructions relating to the shipment of a consignment of goods. It generally shows the names of the consignor and consignee, the point of origin, the destination, route, method of shipment, and the amount charged.

The U.S. Department of Transportation's Surface Transportation Board, Office of Economics, Environmental Analysis, and Administration maintains a database of railroad waybills—the waybill file. A statistical sample of these waybill data (3 percent) is available to the public, then these raw sample data must be extrapolated for developing meaningful total estimates.

The average cost of moving potatoes from the Northeast by rail was $42.26 per ton. Movements were likely made on flat cars—probably in refrigerated truck trailers (trailer on flat car, or TOFC) or containers loaded onto flat cars (container on flat car, or COFC). Standard refrigerated railcars, which hold 60 or more tons of potatoes, were not noted in the waybill data for the Northeast. (However, site visits to Boston, MA, and to Jessup, MD, revealed Idaho potatoes being unloaded from refrigerated railcars.) Potatoes from the Northeast that were shipped by rail mostly went to the Southeast. A small percentage of the shipments remained in the Northeast, with the largest number of trips being less than 1,200 miles regardless of destination. Individual shipments were generally small, usually between 10 and 26 tons per railcar, confirming the use of trailers and containers (TOFC and COFC) rather than traditional refrigerated railcars which have a much higher carrying capacity.

Maine's Rail System

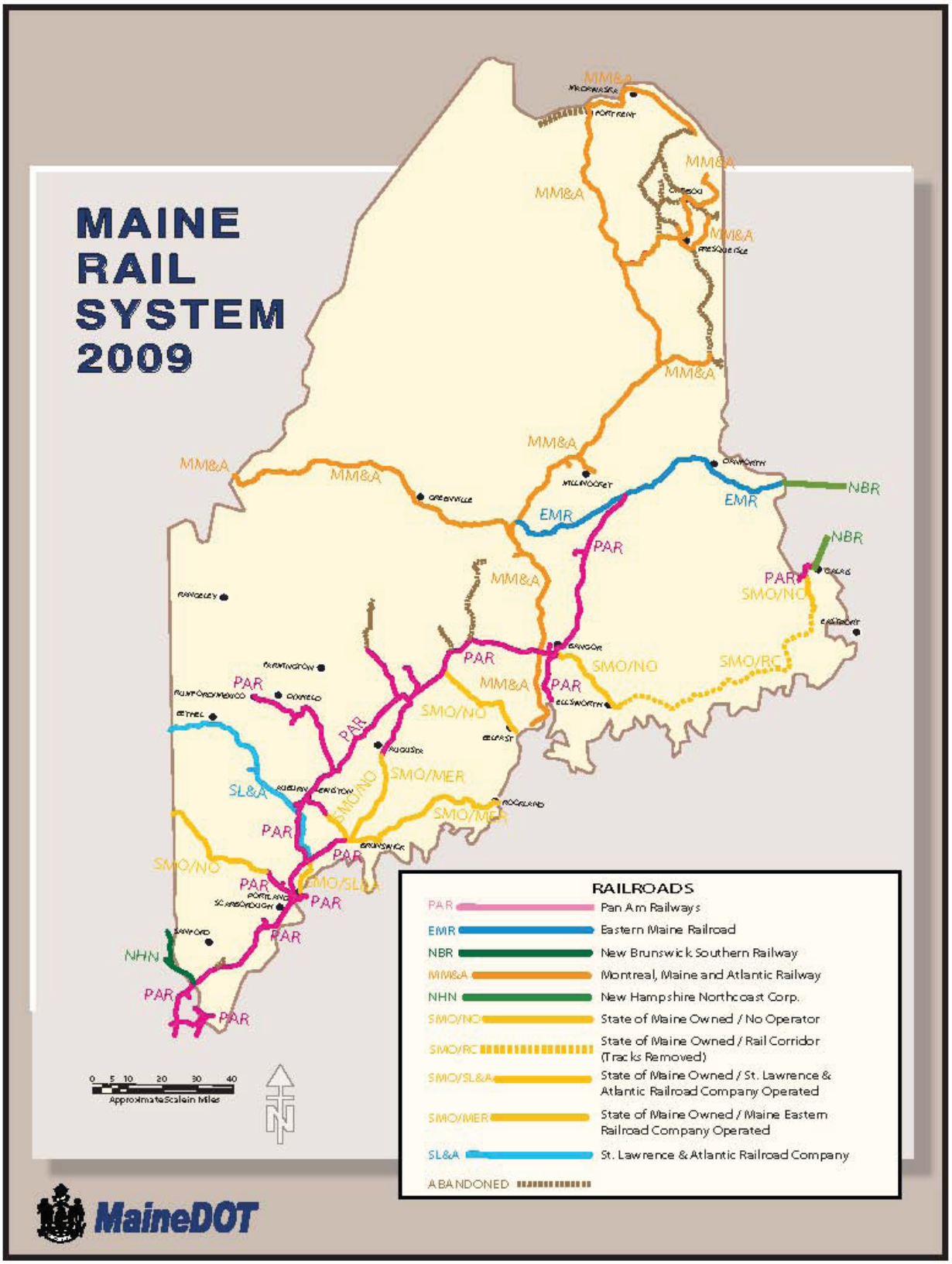
Maine has had railroads since the early twentieth century. They were primarily built to move forest and farm products (lumber, paper, potatoes, etc.) from rural areas to markets in Portland and the coast, farther south to Boston and New York, or west to Canada and the Midwest. Along with the entire rail industry, Maine's railways suffered from competition from trucks, declines in profitability, and changes of ownership. Examination of figure 27 shows that tracks are owned by several different entities, forcing potatoes and other fresh produce from northern Maine to travel over trackage owned by several entities before being able to leave the State. This adds to cost, time, and the probability of a refused load. Maine is at a disadvantage in this respect.

60 AAR, 2006 Freight Commodity Statistics

61 Northeastern States include the New England States and PA, NY, and NJ.

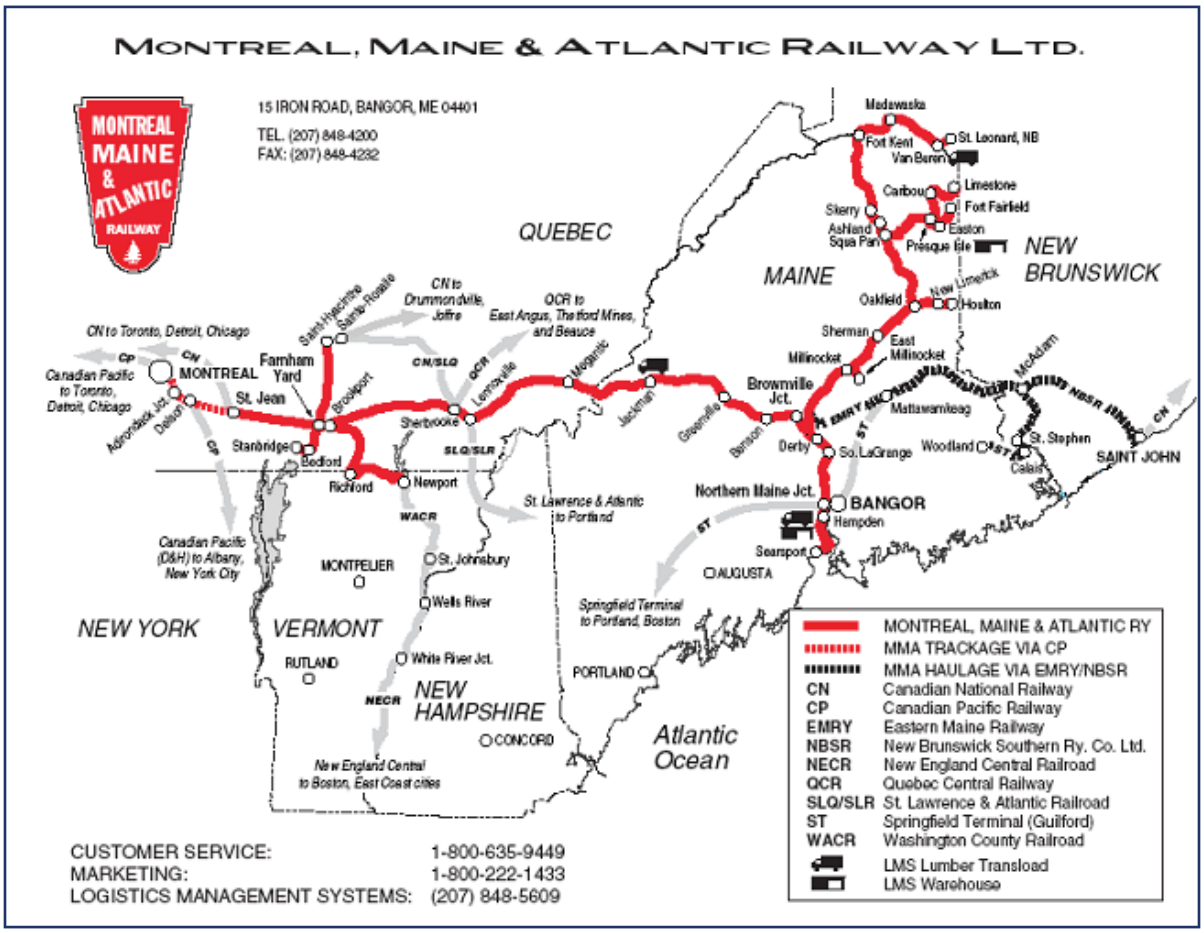
62 Southeastern States include DE, MD, DC, VA, WV, NC, SC, GA, and FL.

Figure 27. Ownership of rail infrastructure in Maine



Source: Maine DOT http://mainegov-images.informe.org/mdot/utilities/pdf/railmap.pdf (PDF)

Figure 28. Montreal, Maine, and Atlantic Railway trackage in Maine, New Hampshire, and Vermont



Source: Montreal, Maine, and Atlantic Railway[63]

Figure 28 shows rail trackage in northern Maine operated by the Montreal, Maine, and Atlantic (MM&A) Railway. MM&A tracks serve potato farmers in Aroostook County.

Pan Am Railways (PAR)[64] is a holding company that owns and operates a Class II regional railroad in northern New England. The primary subsidiaries of PAR are the Maine Central (MEC), the Boston and Maine (B&M), and Springfield Terminal Railways. Pan Am purchased the name, colors, and logo of Pan American airlines in 1998.

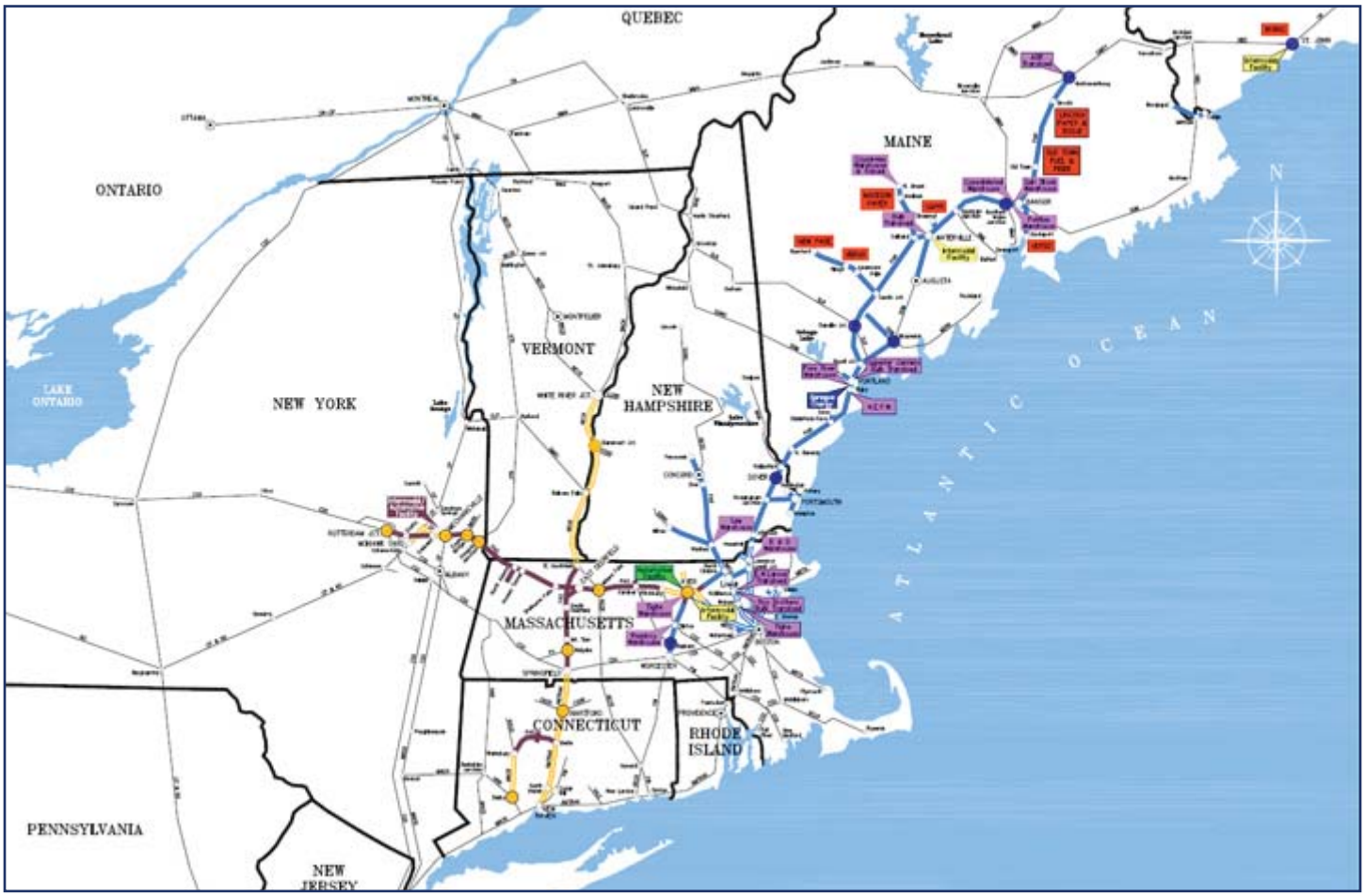
A survey of rail users in Maine (Argus 2008) found that Pan Am, the largest operator of rail in the State, received most complaints for poor service (68 percent of the business, but 86 percent of the complaints).

To complicate the situation further, Pan Am rail announced an operating agreement with Norfolk Southern to improve rail service from New York State into Boston. This will allow Western United States potato producers better access to the Boston market, but will do little to increase the ability of Maine growers to ship potatoes outside the State. Figure 29 shows that Pan Am's service from Schenectady, NY, to Boston, MA, will help potato shipments from Railex's new potato handling facility in Rotterdam, NY, be sent to Boston.

63 http://www.mmarail.com/downloads/mma_rail_map.pdf (PDF)

64 http://www.panamrailways.com

Figure 29. Pan Am Railway system in New England



Source: Pan Am Railways (http://www.guilfordrail.com/Maps/map.htm)

Railcars in Other States

The State of Washington developed a program in the summer of 2006 to provide railcars to Washington potato shippers, leasing 31 refrigerated railcars from Rail Logistics Cold Train. The newly created Washington Produce Rail Car Pool was funded by Federal monies. The rail car pool idea was introduced by the Washington State Potato Commission in 2001. Congress provided $2 million as startup for the project, with the Washington legislature providing funds for startup operations and contract monitoring. Lease payments are $1,000 per month. In return, the Rail Logistics program rebates $750 for each shipment from a Washington shipper.

Railex[65] is a privately owned rail firm that ships apples and potatoes (and other products) from Wallula, WA, and Delano, CA, to Rotterdam (Schenectady), NY. Trains are operated by Union Pacific and CSX railroads. Each end of the rail line is built specifically for handling refrigerated railcars. The cost of moving one carload of potatoes on Railex, approximately $7,000 in 2008, is more expensive than conventional rail transport (roughly $4,000), but less expensive than trucking. Trucks can carry about 20 tons of potatoes per load, compared with the large Railex cars, which can carry 50 tons. Trucks moving spuds from Washington to Albany cost a little more than $5,000 per trailer load in 2008—about $13,000 for a 50-ton shipment. The advantage of the specialized Railex service is its speed. Weekly service, with a five-day transit time, provides much faster service than conventional point-to-point rail service, nearly equaling the speed of trucking. The rail movements are made up of 55 rail cars. Each car is a newly built, refrigerated 65-footer. The quick transit time is explained by the cars remaining as a "unit," with cars linked together from origin to destination, bypassing traditional rail yards and stopping only to fuel and change crews.

Since Railex is associated with Hapco produce and AMPCO Distribution Services, it is in the produce business as well as providing transportation services. As mentioned previously, this state-of-the-art facility is ideally located for repacking potatoes from Washington to serve the Boston market using the Pan Am/ Norfolk Southern joint venture that provides rail service from Rotterdam, NY into Boston.

65 http://www.railexusa.com/

Water Transportation

Potatoes are not limited to transport by truck or rail. Refrigerated containers of potatoes may be exported to foreign customers or transported from one U.S. location to another via barge or container vessel or even combinations of barge, container ship, rail, and truck. Potato exporters from western production areas use such ocean ports as Portland, OR, to ship spuds overseas. Consequently, it seemed appropriate to examine how this system works for Western potato shippers and what the possibilities in Maine might be for the water shipment of Maine potatoes.

Water Transportation on the Columbia River

For comparison, let's look at transportation on the Columbia River. The Columbia flows along the border of Oregon and Washington in the Pacific Northwest, providing waterborne transportation for import and export cargo. Barge transportation moves commodities from as far north as Lewiston, ID, 365 miles upriver, and ocean-going vessels approach such ports as Portland, OR, Vancouver, WA, and Kalama, OR—more than 100 miles from the Pacific Ocean.

Potato exporters in the Pacific Northwest use the Columbia and Snake Rivers to access ocean-going vessels at the port of Portland. Because barge transportation offers the most cost-efficient method to move cargo, barge operators on the Columbia and Snake Rivers install generator power to keep refrigerated containers at consistent temperatures during transit. Barge rates for moving these refrigerated containers range from $110 to $115 for a 20-foot container and $210 to $215 for a 40-foot container.

The Columbia River has a channel depth of 40 feet. The increasing draft of container ships has caused several large ocean shipping lines to discontinue vessel calls at the Port of Portland, forcing potato exporters to truck their products farther north to larger ports, such as Seattle and Tacoma, WA. Ocean shipping lines use Seattle and Tacoma that accommodate their deeper draft vessels instead of ports on the Columbia River. Seattle and Tacoma exported 69 percent of U.S. containerized refrigerated potatoes in 2006—up from 53 percent in 2004. Portland exported only 4 percent in 2006—down from 27 percent in 2004. Deepening the Columbia River channel to 43 feet, as proposed by the ports on that river, might bring potato export shipments back to the Columbia River ports.

These fine West Coast ports present a great resource for Western potato exporters and offer an interesting model for Maine to consider with its inland potato producers and deep water and river ports.

Maine's Ocean Ports

The major water ports in Maine are Portland, Searsport, Bucksport, Eastport, and Bangor. Domestic waterborne commerce through these ports consists of petroleum products and a few shipments of gravel and cement. The State imports almost four times as much as it exports to neighboring States via these ocean ports—shipping out mostly raw materials, such as paper and wood pulp, and bringing in various petroleum products.

The Port of Portland is the largest port in the State. Its naturally deep water provides service for all types of water craft, including container ships and tankers as well as ferries and leisure craft. Portland does not offer direct access to foreign markets, but provides feeder vessel service to such larger East Coast ports as Boston and New York/New Jersey. In Auburn, only 45 minutes north of Portland, the St. Lawrence and Atlantic Railroad operates an intermodal freight transfer facility (IFTF) with connections to Canadian National Railroad (CN). CN provides direct access for Maine shippers to Midwest and West Coast destinations. The IFTF offers freight handling capabilities to transfer containers from trucks to rail.

Farther up the Maine coast is the Port of Searsport, located in Penobscot Bay at the mouth of the Penobscot River. Searsport moves dry and liquid bulk cargo, including concrete, coal, pulp, and paper. According to the Montréal, Maine & Atlantic Railway Web site, Searsport is served by daily freight rail service from Madawaska in northern Aroostook County, which could move containers of potatoes from Madawaska to Searsport by rail for water transport to the south.

The ports of Bucksport and Bangor are north of Searsport on the Penobscot River. The Port of Bucksport provides service for ocean-going tankers and fuel barges, handling mostly liquid bulk commodities. The Port of Bangor, located at the northernmost navigable portion of the River, services fuel barges and other shallow-draft vessels.

Eastport,[66] the easternmost port in the United States, is a deep, natural harbor with a mean low depth of 64 feet at one terminal and 42 feet at the other, with approach depths of 100 feet each. Eastport has two terminals and the ability to accommodate ships up to 900 feet long.

The water ports in Maine currently do not handle domestic refrigerated products for export. However, short-sea shipping opportunities for containers at the port of Portland are becoming more common. Portland currently serves container-on-barge movements to and from New York/New Jersey, which is likely to become a viable alternative as congestion worsens on I-95 and other popular north-south corridors.

66 www.portofeastport.org

Marketing Successes and Opportunities for Maine

Despite some setbacks in the potato marketplace, Maine has had several marketing successes in recent years, and the State's potato farmers have strengths that could lead to further opportunities. Some better-known successes of the Maine tablestock potato industry are:

- Local organic potato production
- Chef's potatoes
- "Get Real, Get Maine" State branding and promotion program
- Marketing Maine potatoes through Wal-Mart.

Other advantages that may help Maine potato farmers include proximity to several major U.S. markets, the weakness of the U.S. dollar relative to Canadian currency, the high cost of such corn and corn products as cornstarch, the growing consumer trend to "buy local," and the strong market appeal of anything associated with the clean air and pine trees of Maine.

Another opportunity for Maine producers is the railroads' growing need to increase traffic in Northern Maine. Because the lumber and paper businesses are slow, railroads are becoming more interested in moving potatoes. Rail is an economical way to move bulk items. If equipment and scheduling challenges could be met, the competitiveness of Maine potatoes would improve in markets served by rail. When contacted by AMS, MM&R sales staff expressed great interest in providing service to Maine potato growers.

Some other opportunities include:

- Potatoes for plastics and other industrial uses
- The "buy local" food program promotions of Whole Foods Market and other retailers.

Some common threads run through all these success stories and opportunities. For example, organic potatoes and Chef's potatoes are examples of high-quality products. The increased consumer interest in buying local is demonstrated by local organic production and Maine potatoes in local Wal-Marts. All three are examples of niche marketing, and also show the benefits of combined marketing programs—the potatoes come from many farms, yet are marketed under one combined umbrella.

Organic Production

Jim and Megan Gerritsen, owners of Wood Prairie Farm,[67] are well-known organic potato producers and marketers from Aroostook County. They (and the other organic producers that grow for them) have a thriving mail-order business to individuals, and sell wholesale to stores such as Whole Foods Market.

It should be noted, however, that most potato farmers we visited were strongly opposed to organic production in their region. They view organic fields as potential reservoirs of late blight, a serious potato disease and the cause of the infamous Irish potato famine. If left unchecked, late blight has the potential to destroy the entire Maine potato crop. Conventional growers worry about organic growers' ability to control late blight without pesticides as well as the opposition of organic producers to widespread aerial application of fungicides to conventional potato fields.

The conventional growers we interviewed told us that they are not interested in growing organic potatoes. Some growers, especially small producers, they pointed out, can benefit from the higher prices they can charge for organics. In addition, if small producers are successful in this niche market, they don't have to compete against high-volume commodity production. Larger potato growers, however, wouldn't see much benefit from the extra time and labor, greater risk, and higher production costs required in organic production.

Chef's Potatoes

These large white potatoes are often sold in 50-pound sacks for institutional and restaurant use. Larger sizes are more efficient for preparing in the kitchen, as the amount of peeling per unit weight decreases with larger sizes. Maine-produced Chef's potatoes have been a hit with buyers. This specialized extra-large sizing/marketing strategy parallels the success of the Biggins brand of Russet baking potatoes marketed by the Russet Potato Exchange (RPE).

67 www.woodprairie.com

Get Real, Get Maine!

Get Real, Get Maine! is a promotional campaign developed and operated by the Maine Department of Agriculture to increase the sales of Maine-grown and Maine-caught products including blueberries, salmon, apples, potatoes, and Christmas trees, to name only a few. Events, media advertising, point of source materials, and an attractive logo are part of the program. With the increased awareness of the popularity of locally produced foods, the program was focused on Wal-Mart stores as a large potential outlet for Maine potatoes.

Wal-Mart Local Food Initiative

The State of Maine recently announced that the Maine Potato Board, Wal-Mart Supercenters, Bushwick Potato Company, and Guerrette Farms have embarked on a campaign to bring fresh tablestock potatoes to Maine consumers. Wal-Mart Supercenters across the State will feature 10-pound bags of potatoes with the "Get real, get Maine!" logo. Although the program was touted originally as an effort to sell to consumers only in the State, Maine potatoes with the "Get real, get Maine!" logo have appeared in Wal-Mart stores in many other States.

Potatoes to Plastics

Earth-friendly, bio-based plastics have been available for many years, but most were made from cornstarch. Today's higher corn prices, driven up by the demand for ethanol, make potatoes a viable alternative starch source. Some manufacturers are considering Maine potatoes as a possible source of starch for plastics production.

NatureWorks® LLC,[68] a joint venture between Cargill and the Japanese firm Teijin Limited, is the world's leading provider of PLA-based plastics. Its Web site says: "Our manufacturing facility, located in Blair, Nebraska, United States, has a name plate (annual) capacity of 300 million pounds (140,000 metric tons) of polymer. Our plant came online in 2002. In 2003, NatureWorks built the world's largest lactic acid manufacturing facility to feed our polymer plant. In 2005, NatureWorks purchased Renewable Energy Certificates (green energy) to offset all non-renewable energy used for our entire 2006 production, making NatureWorks biopolymer the first commercially available polymer with significantly reduced greenhouse gas emissions."

NatureWorks does business in North America, Europe, and Asia Pacific. It works with brand owners and retailers around the world to help introduce NatureWorks biopolymer and Ingeo™ fiber products into the plastic and synthetic fibers marketplace.

Figure 30. "Get Real, Get Maine" program

68 www.natureworksllc.com

Whole Foods Market and "Local Production" Opportunities

Whole Foods Market promotes its policy of buying locally, even offering "infrastructure loans" to farmers. The loans are limited to $50,000, with a maximum period of 10 years and interest rates of 4–10 percent. Most producers under this program are organic operations, but not all. Whole Foods Market employs regional "foragers" who promote local purchasing. "Local" has different definitions depending on the location. Sometimes Whole Foods Market managers consider "local" to be within 25 miles of a store; other times it can be as much as a 7-hour drive from the retail site. Because Boston is 7 hours and Portland, ME, is more than 5 hours away from potato production areas in extreme northern Maine, using a yardstick of 7 hours for "local" would identify Keith Masser in Sacramento, PA, as a "local" processor for Boston, rather than Luke Derosier, a grower in St. Agatha, ME.

We met the Whole Foods Market forager responsible for the northeastern region of the country. It was an encouraging meeting from the small-grower perspective. Whole Foods Market already works with hundreds of small growers in this region and many more in other regions. For small growers, long-term relationships with relatively large grocery chains are beneficial for financial and stability reasons. As long as producers can meet the chain's high production standards required, they can rely on consistent markets for at least some of their products.

Whole Foods Market already buys organically grown potatoes from farmers in the Presque Isle area and showed little interest in sourcing conventionally produced generic round white tablestock potatoes from Maine. The firm is primarily interested in obtaining novelty and unusual products that can help distinguish Whole Foods from other food retailers. The potato growers in Maine would benefit if they followed a similar strategy of producing and marketing products that can be distinguished from their competitors, potatoes or other food products produced in Maine.

The Whole Foods Market regional foragers' office in Boston works with 300 producers, whose farms range in size from 2 to 800 acres, to supply the 30 Whole Foods Market stores in the New England and Mid-Atlantic regions. The company, in its own words, does everything it can to work with farmers in a mutually beneficial manner. To accommodate the needs of small-scale growers, Whole Foods Market tries to provide backhaul for local growers to their distribution center when it is convenient to their store delivery routes. Also, rather than assuming all farmers have access to e-mail, Whole Foods Market relies on faxes, which virtually all farm businesses have.

Whole Foods Market advises farmers to approach company representatives when they are likely to have free time to discuss new business—in mid-winter, rather than during the busy holiday retail season of October through December. Farmers are encouraged to meet with buyers beginning in January to talk about their upcoming season and discuss varieties to plant in the coming year.

An encouraging sign for small farmers is that other large grocery chains in the region also recognize the increasing demand for locally grown food, and are focusing more and more on local growers.

Heritage Potatoes

As with local production and eco- and organic labeling, heritage potatoes fill a niche market that some Maine producers might be able to enter. The market for heritage potatoes in the United States is not well developed, unlike those for heritage tomatoes and apples, but Whole Foods Market may be a possible outlet for this novelty item.

"Eco-Labeled" Potatoes

Another possible marketing strategy for Maine potatoes is eco- or IPM-labeling, which has been tried in Wisconsin with modest success. However, consumers may be uncertain about what an "eco" labeled potato is, and why there is a need for such a product.

The Wisconsin Eco-Potato Partnership[69] has been promoting environmentally friendly, ecologically sound, and economically viable potato production for more than 10 years. Project partners believe that "biointensive" IPM is the surest way to sustain profitable agriculture while enhancing environmental quality and reducing risks associated with agricultural production systems.

69 ipcm.wisc.edu/ProgramInfo/EcoPotato/tabid/87

Conclusions and Recommendations

Maine has been—and probably will continue to be—an important potato production area for the United States. For the industry to operate properly and efficiently, it needs to include a viable tablestock component.

This report contains suggestions and ideas from other production areas and other commodities. Here is a summary of those suggestions and ideas:

- Develop a unified joint marketing strategy, probably through a cooperative or other formal marketing structure. Pooling resources, including both potatoes and capital, could help growers increase returns and volume of potatoes marketed.
- Develop an even stronger commitment to quality to maintain customer satisfaction with the size and quality of Maine potatoes. Financial incentives, such as those currently used by potato processors to encourage quality, could be incentives to maintain high standards.
- Take advantage of the "buy local" movement with marketing strategies that identify the product as local and regional (Maine) and that emphasizes the healthy land, air, and water of Maine.
- Continue investigating markets for unwanted lower grade potatoes, including dehydrated flakes, meal, plastics, and starch. A commitment to quality will increase the need to develop markets that can accommodate lower graded potatoes.
- Establish a professional sales staff dedicated to marketing Maine potatoes.
- Investigate the possibility of marketing a greater diversity of potato sizes, colors, and varieties, with packaging and promotion to match.
- Actively work to improve existing rail and water transportation systems to reduce shipping costs to major East Coast markets.

In addition to these marketing ideas, some production and postharvest changes would improve the sales of Maine tablestock potatoes. They include:

- Encourage planting in fine-textured soils with few rocks that will cause the least abrasion, producing tablestock potatoes with fewer cosmetic deficiencies.
- Install irrigation systems. Irrigated potato land in the West produces larger and more consistent crops than those grown in Maine.
- Continue Maine Extension's bruise prevention program for fresh potatoes, which is a model for the nation. Don't forget the lessons learned.
- Continue to improve potato storage. Use energy-efficient ventilation systems and VFD fan drives to improve quality and save storage costs.
- Consider refrigeration, especially in repacking facilities. The best repacking operations, such as those employed by RPE in Wisconsin and Masser in Pennsylvania, use state-of-the-art refrigerated storage facilities after washing and grading to keep potatoes at optimum temperatures.
- Improve washing and drying procedures. Almost all tablestock potatoes in commerce today have been washed. Future Maine high-end repacking facility should incorporate washing, drying rollers, heated-air drying, and cold air/refrigeration.
- Improve packaging. Consumer packaging for potatoes has several purposes beyond merely containing the potatoes. Packages should be colorful to entice retail buyers and consumers, educate them about the distinctive characteristics of their products, and differentiate Maine potatoes from generic commodities. Using some of the popular images associated with Maine itself—old-fashioned Yankee values, lobsters, canoes, moose, clean air and water, and pine trees—could be expected to generated substantial appeal among buyers and consumers. Other considerations for innovative packaging might include:
    - Conveniently packaged single potatoes for cooking in the microwave
    - Recipes and storage tips
    - "Homespun" stories about the farmers who raised the potatoes
    - Photos of farms and farmers
    - The farmer's story

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70 Each year, the Association of American Railroads (AAR) (http://www.AAR.com) provides to the Surface Transportation Board (STB) a 3-percent stratified sample of the rail traffic across all the commodity segments. This annual Public Waybill sample has approximately 500,000 records of data and spans several commodity segments. The data is available from several third parties in searchable format.

Additional Resources

Energy Information Agency. The Energy Statistics Web site has costs and prices for all forms of energy. http://www.eia.doe.gov/fuelelectric.html.

Irish Seed Savers. Taste trials of heritage potatoes. http://www.irishseedsavers.ie/article.php?artid=97.

Maine Potato Board. Links to most of the important potato information Web sites. www.Mainepotatoes.Com

Masser Potato Farms. Pennsylvania grower and category management marketer. www.masserspuds.com.

National Potato Council Web site. http://www.nationalpotatocouncil.org/NPC/potato_potatoproduction.cfm.

Russet Potato Exchange. Uses category management as a marketing strategy. Also uses modern postharvest handling and storage. www.rpespuds.com.

Seed Savers Exchange. Sells heritage and unusual potato varieties and USDA Certified Seed Potatoes. http://www.seedsavers.org/Items.aspx?hierId=88

Spudsmart. An online Canadian potato magazine. http://www.spudsmart.ca.

USDA AMS Market News. http://www.marketnews.usda.gov/portal/fvo.

USDA National Organic Program. http://www.ams.usda.gov/AMSv1.0.

United Potato Growers of America. A potato growers' cooperative that attempts to keep prices and income up by controlling acreage. http://www.unitedpotatousa.com.

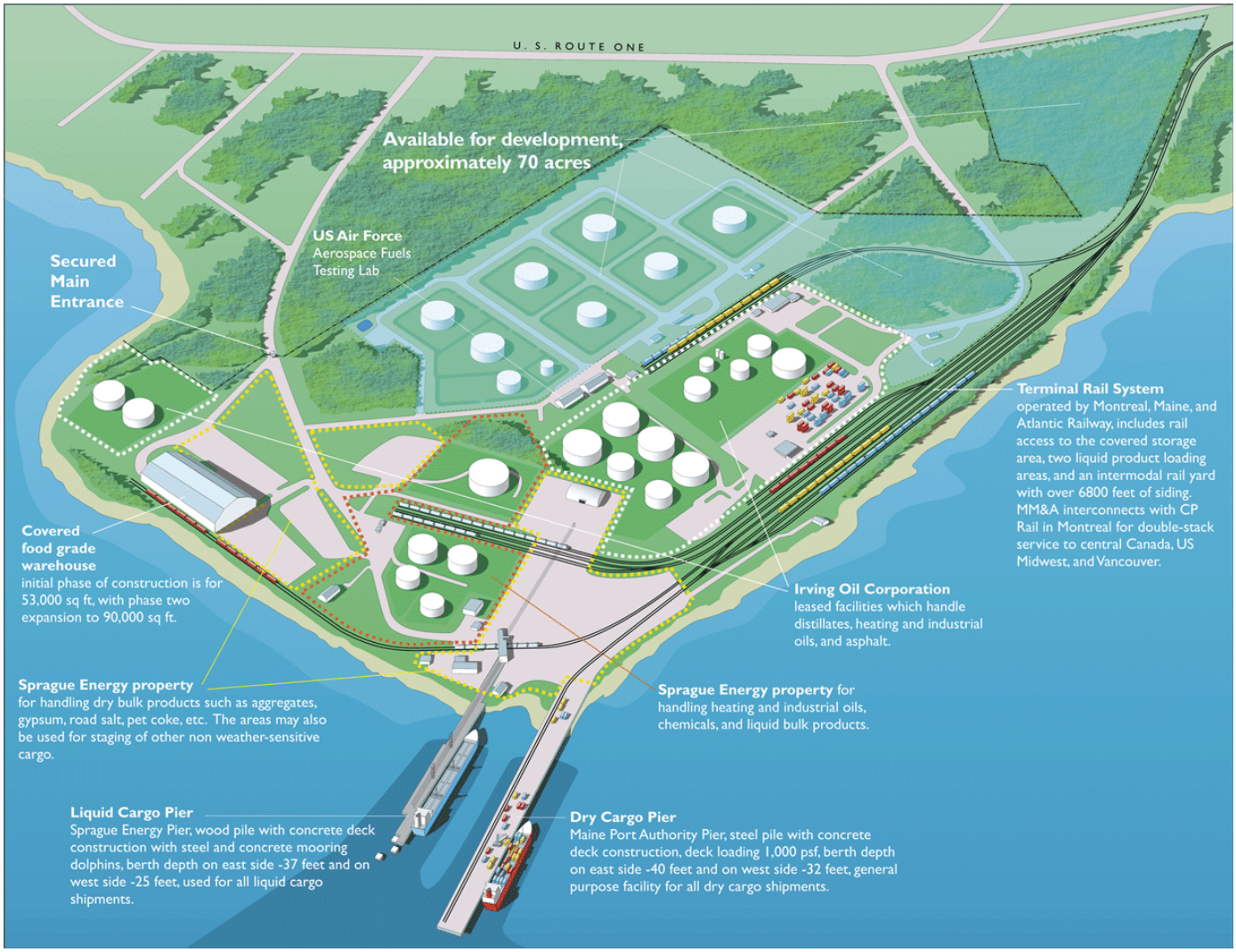
Appendix 1: Typical Potato Packaging and Sources

Masser Potato Farms (http://www.masserspuds.com) is a grower, packer, and repacker of potatoes in Pennsylvania. Note that Masser sources round white, Russet, and Chef's potatoes from Maine and other areas, as well as from Pennsylvania.

Item	May/June	July/Aug	Sept/Oct	Nov/Dec	Jan/Feb	Mar/Apr
5 lb. Country Style Reds	FL	NC, MN	WI, NY	ND, NY	ND, NY	ND, NY
5 lb. Masser Golden	FL	NC, VA, NJ	PA, NJ	PA, NY	PA, NY	PA, NY
5 lb. Blue Denim Poly White	FL	NC, VA, NJ	PA, NJ	PA	PA, ME	PA, ME
5 lb. Blue Denim Paper White	FL	NC, VA, NJ	PA, NJ	PA	PA, ME	PA, ME
10 lb. Blue Denim Poly White	FL	NC, VA, NJ	PA, NJ	PA	PA, ME	PA, ME
10 lb. Blue Denim Paper White	FL	NC, VA, NJ	PA, NJ	PA	PA, ME	PA, ME
5 lb. Masser Russet	ME	NC, CA, VA	WI, ME, MI	WI, ME, MI	WI, ME, MI	WI, ME, MI
10 lb. Masser Russet	ME	NC, CA, VA	WI, ME, MI	WI, ME, MI	WI, ME, MI	WI, ME, MI
15 lb. Masser Russet	ME	NC, CA, VA	WI, ME, MI	WI, ME, MI	WI, ME, MI	WI, ME, MI
50 lb. Blue Denim Paper	FL	NC, VA, NJ	PA, NJ	PA	PA, ME	PA, ME
50 lb. Blue Denim Paper Chefs	FL	NC, VA, NJ	PA, NJ	PA	PA, ME	PA, ME
50 lb. Masser Size B	FL	NC, VA, NJ	PA, NJ	PA	PA, ME	PA, ME
50 lb. Masser Russet	FL	NC, MN	WI, NY, MN	ND, NY	ND, NY	ND, NY
50 lb. Red Barn Red Size A	FL	NC, MN	WI, NY, MN	ND, NY	ND, NY	ND, NY
50 lb. Red Barn Red Size B	FL	NC, MN	WI, NY, MN	ND, NY	ND, NY	ND, NY
50 lb. Masser Yellow Size A	FL	NC, VA, NJ	PA, NJ	PA, NY	PA, NY	PA, NY
50 lb. Masser Yellow Size B	FL	NC, VA, NJ	PA, NJ	PA, NY	PA, NY	PA, NY
50 lb. Masser Russet Counts	ME	NC, VA, CA	PA, NJ	WI, ME, MI	WI, ME, MI	WI, ME, MI

Appendix 2: Mack Point Marine Intermodal Cargo Terminal

The Mack Point Marine Intermodal Cargo Terminal at Searsport, ME (http://www.mackpoint.com). Notice the covered food grade warehouse with rail connection.



Source: Sprague Energy Corporation

Appendix 3: U.S. Retail Electric Rates

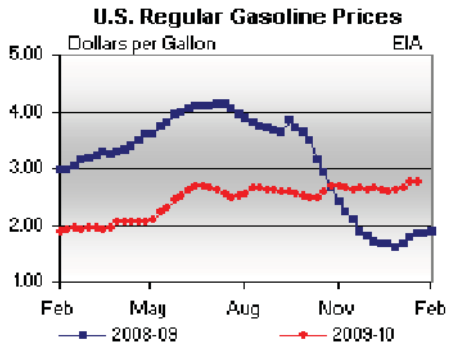
Average retail price of electricity to ultimate customers by end-use sector, by State, September 2007 and 2006 (cents per kilowatt/hour)										
Census Division and State	Residential		Commercial[1]		Industrial[1]		Transportation[1]		All Sectors	
	Sep-07	Sep-06	Sep-07	Sep-06	Sep-07	Sep-06	Sep-07	Sep-06	Sep-07	Sep-06
New England	16.46	16.44	14.96	14.99	12.23	11.47	8.85	12.02	14.98	14.75
Connecticut	18.5	18.64	14.9	14.97	12.13	12.18	13.94	15.29	15.75	15.84
Maine	15.23	13.74	12.5	11.52	11.49	7.92	--	--	13.18	10.92
Massachusetts	16.24	16.59	15.86	16.33	13.28	13.09	--	--	15.5	15.75
New Hampshire	14.67	14.39	13.91	13.55	11.1	10.91	--	--	13.64	13.36
Rhode Island	15.47	15.33	14.23	13.48	12.84	12.16	--	--	14.54	13.94
Vermont	14.28	13.73	12.19	11.67	8.87	8.42	--	--	12.01	11.45
Middle Atlantic	14.59	14.3	13.87	13.58	8.06	7.87	12.21	11.26	13	12.62
New Jersey	15.61	13.85	14.71	12.83	11.88	10.35	13.05	10.12	14.72	12.79
New York	17.16	17.92	16.13	16.6	9.33	10.02	13.92	12.54	15.73	16.3
Pennsylvania	11.31	10.55	9.17	9.06	6.86	6.58	6.72	6.78	9.15	8.67
East North Central	9.99	9.59	8.46	8.28	6	5.53	7.04	6.21	8.07	7.59
Illinois	10.68	9.21	8.64	8.39	6.75	5	6.62	5.83	8.72	7.49
Indiana	8.4	8.49	7.38	6.99	5.25	4.94	10.89	10.81	6.77	6.44
Michigan	10.16	9.94	8.43	8.56	6.27	6.26	9.09	10.56	8.25	8.08
Ohio	9.95	9.89	8.67	8.48	5.78	5.58	11.2	10.49	8.04	7.75
Wisconsin	10.84	10.81	8.92	8.52	6.25	6.3	--	--	8.55	8.34
West North Central	8.51	8.64	6.9	6.84	5.23	5.18	8.67	8.65	6.98	6.93
Iowa	9.68	10.53	7.35	7.93	5.07	5.43	NM	7.05	7.14	7.6
Kansas	8.63	9.07	7.04	7.38	5.19	5.49	--	--	7.06	7.36
Minnesota	8.87	8.7	7.3	6.98	5.66	5.22	9	9.35	7.27	6.9
Missouri	7.77	7.81	6.42	6.08	4.98	4.81	8.38	7.95	6.69	6.48
Nebraska	8.75	8.51	6.85	6.59	4.99	4.95	--	--	6.86	6.65
North Dakota	8.24	8.25	6.95	7.12	5.49	5.29	--	--	6.86	6.88
South Dakota	8.74	8.31	6.86	6.78	5.23	4.89	--	--	7.2	6.92
South Atlantic	10.38	10.25	8.7	8.71	5.9	5.66	9.8	9.59	8.98	8.82
Delaware	13.68	13.62	11.29	11.85	9.12	8.63	--	--	11.7	11.61
District of Columbia	12.22	11.39	12.73	12.92	--	--	11.5	12.15	12.55	12.78
Florida	11.28	11.47	9.57	9.9	7.82	7.96	9.64	10.15	10.37	10.59
Georgia	9.59	9.21	7.86	7.72	5.59	5.27	6.83	6.54	8.09	7.78
Maryland	13.26	11.06	11.71	11.76	9.86	8.38	10.82	9.84	12.18	11.11
North Carolina	9.6	9.68	7.62	7.43	5.88	5.53	50	2.78	8.19	7.99
South Carolina	9.2	9.29	7.88	7.76	5.2	5.04	--	--	7.47	7.32
Virginia	9.13	8.87	6.58	6.29	5.1	4.73	6.83	6.61	7.37	6.99
West Virginia	6.88	6.77	5.81	5.63	4.05	3.8	5.32	5.1	5.4	5.14
East South Central	8.22	8.43	7.91	7.95	5.08	4.97	8.55	11.58	7.04	7.01
Alabama	9.25	9.13	8.6	8.42	5.32	5.22	--	--	7.66	7.49
Kentucky	7.16	7.24	6.66	6.4	4.33	4.1	--	--	5.73	5.45
Mississippi	9.35	9.56	8.69	8.92	6	5.94	--	--	8.19	8.31
Tennessee	7.56	7.91	7.8	8.02	5.35	5.36	8.55	11.58	7	7.14

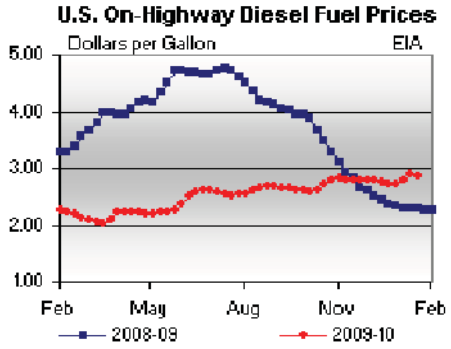
West South Central	11.4	12.08	9.4	9.56	7.08	7.15	8.59	8.73	9.58	9.86
Arkansas	9.02	9.51	6.97	7.35	5.51	5.74	--	--	7.29	7.61
Louisiana	9.25	9.7	8.75	9.25	6.47	7.01	11.75	16.45	8.26	8.71
Oklahoma	9.72	9.85	8.11	8.1	5.37	5.26	--	--	8.03	7.96
Texas	12.5	13.25	10.01	10.07	7.82	7.71	8.37	8.47	10.47	10.69
Mountain	9.77	9.4	7.92	7.84	6.14	5.84	7.56	8.34	8.15	7.83
Arizona	10.16	9.89	8.68	8.53	6.19	6.04	--	--	9.12	8.83
Colorado	9.1	9.07	7.23	7.46	5.9	5.84	6.84	7.83	7.55	7.57
Idaho	6.78	6.22	5.24	4.94	4.48	3.61	--	--	5.36	4.7
Montana	9.15	8.83	7.97	7.62	6.06	5.37	--	--	7.65	7.11
Nevada	11.88	11.04	10.13	10.25	9.57	9.21	10.13	10.9	10.62	10.16
New Mexico	9.2	9.27	7.55	7.67	5.62	5.76	--	--	7.48	7.49
Utah	8.43	7.77	7.13	6.56	5.07	4.58	7.8	7.92	6.91	6.29
Wyoming	8.26	8.43	6.29	6.41	4.08	4.06	--	--	5.28	5.37
Pacific Contiguous	13.06	12.43	12.21	12.58	8.64	8.45	8.34	7.53	11.77	11.6
California	14.97	14.57	13.99	14.57	10.92	10.9	8.37	7.56	13.78	13.85
Oregon	8.78	7.68	7.23	6.79	5.24	5.06	6.79	6.23	7.17	6.55
Washington	7.61	7.11	6.52	6.65	4.78	4.63	5.65	6.12	6.43	6.22
Pacific Noncontiguous	20.65	21	17.47	17.73	16.52	16.95	--	--	18.12	18.47
Alaska	15.39	15.31	12.17	11.66	11.86	11.89	--	--	13.05	12.84
Hawaii	23.51	24.22	21.4	22.37	18.21	18.55	--	--	20.87	21.5
U.S. Total	**10.94**	**10.94**	**9.88**	**9.89**	**6.55**	**6.37**	**10.67**	**10.11**	**9.44**	**9.32**

[1] See Technical notes for additional information on the Commercial, Industrial and Transportation sectors.
R = Revised.
NM = Not meaningful due to large relative standard error or excessive percentage change.
Notes: See Glossary for definitions. Values for 2006 are final. Values for 2007 are preliminary estimates based on a cutoff model sample. See Technical Notes for a discussion of the sample design for the Form EIA-826. Utilities and energy service providers may classify commercial and industrial customers based on either NAICS codes or demands or usage falling within specified limits by rate schedule. Changes from year to year in consumer counts, sales and revenues, particularly involving the commercial and industrial consumer sectors, may result from respondent implementation of changes in the definitions of consumers, and reclassifications. Retail sales and net generation may not correspond exactly for a particular month for a variety of reasons (i.e., sales data may include imported electricity). Net generation is for the calendar month while retail sales and associated revenue accumulate from bills collected for periods of time (28 to 35 days) that vary dependent upon customer class and consumption occurring in and outside the calendar month. Totals may not equal sum of components because of independent rounding.
Source: Energy Information Administration, Form EIA-826, "Monthly Electric Sales and Revenue Report with State Distributions Report."

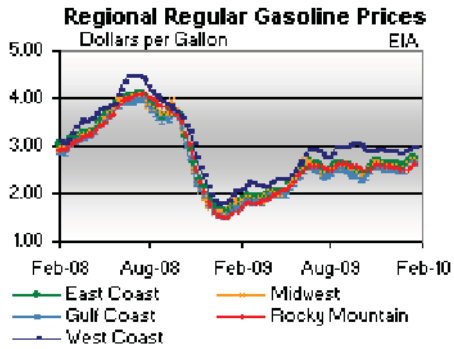
Appendix 4: U.S. Fuel Prices

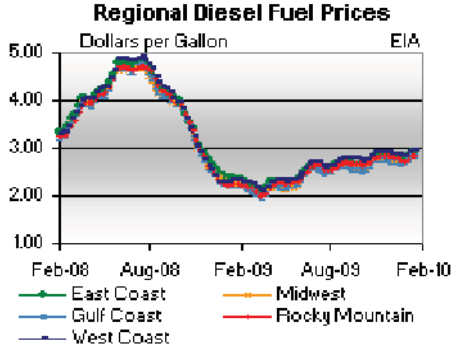
U.S. Gasoline and Diesel Fuel Prices, 01/18/10





Gasoline (Dollars per Gallon)				Diesel Fuel (Dollars per Gallon)			
01/18/10		Change from		01/18/10		Change from	
	Price	Week Ago	Year Ago		Price	Week Ago	Year Ago
United States	2.739	-0.012	0.892	United States	2.870	-0.009	0.574
East Coast	2.751	0.006	0.941	East Coast	2.923	0.001	0.546
New England	2.775	0.006	0.974	New England	3.065	-0.003	0.452
Central Atlantic	2.774	-0.001	0.960	Central Atlantic	3.023	-0.003	0.509
Lower Atlantic	2.726	0.010	0.916	Lower Atlantic	2.867	0.003	0.570
Midwest	2.681	-0.045	0.807	Midwest	2.834	-0.010	0.570
Gulf Coast	2.617	0.001	0.888	Gulf Coast	2.831	-0.015	0.604
Rocky Mountain	2.617	0.039	1.010	Rocky Mountain	2.827	0.013	0.578
West Coast	2.953	-0.013	0.924	West Coast	2.947	-0.024	0.609
California	3.026	-0.020	0.962	California	3.008	-0.024	0.689





Source: Energy Information Agency (EIA) http://tonto.eia.doe.gov/oog/info/gdu/gasdiesel.asp

Appendix 5: Heritage Potato Varieties in Agriculture Canada's Collection

- Angelina Mahoney's Blue
- Banana
- Blue Shetland
- British Columbia Blue
- Cain's Irish Rocks
- Calico
- Candy Cane
- Congo
- Corne de Mouton
- Crotte d'ours
- Fingerling
- Fortyfold
- Garnet Chili
- Haida
- Houma
- Jogeva Yellow Estonian
- Kifli
- La Veine Rose/La Belle Rose
- Lumpers
- Macintosh Black
- Marc Warshaw's Quebec
- Mcintyre Blue
- Mrs. Moehrle's Yellow Fleshed
- Myatt's Ashleaf
- Northern White
- Nova Scotia Blue
- Pink Fir Apple
- Purple Chief
- Rambling Rose
- River John Blue
- Royal Kidney
- Ruby Pulsiver's Bluenoser
- Sharon's Blue
- Siberian
- Skerry Blue
- Slovenian Crescent
- Straight Banana
- White Rural New Yorker
- Yam

Source: Agriculture and Agri-Food Canada. http://dsp-psd.pwgsc.gc.ca/Collection/A47-8-8-2001E.pdf (PDF).

Appendix 6: Summary of Recommendations

We recommend that Maine tablestock potato growers consider these modifications to their current marketing practices to improve profitability and regain market share.

1. Develop a unified, joint marketing strategy, probably through a cooperative or other formal marketing structure. Pooling resources, including both potatoes and capital, could help growers increase returns and/or volume of potatoes marketed.

2. Develop a stronger commitment to quality so customers are more than satisfied with the size and quality of Maine potatoes. Financial incentives, such as those currently used to encourage quality by potato processors, could be employed as incentives to maintain high standards.

3. Take advantage of the "buy local" movement with marketing strategies that identify the product as local and regional (Maine) and include the ideas of the healthy land, air, and water in Maine.

4. Continue to develop markets for lower grade potatoes, such as dehydrated flakes, meal, plastics, and starch. A commitment to higher quality will increase markets for lower grade potatoes.

5. Establish professional sales staff dedicated to marketing Maine potatoes.

6. Investigate the possibility of marketing a greater diversity of product sizes, colors, and varieties, with packaging and promotion to match.

7. Use packaging as a way to tell the story of Maine and its potatoes.

8. Actively work to improve existing rail and water transportation systems in order to reduce shipping costs to East Coast markets.

Appendix 7: Abbreviations Used in This Report

AAR	Association of American Railroads
AMS	USDA's Agricultural Marketing Service
ARS	USDA's Agricultural Research Service
B&M	Boston and Maine Railway
BLS	Bureau of Labor Statistics
Btus	British Thermal Units
COFC	Container on Flat Car
EIA	U.S. Energy Information Administration
ERS	USDA's Economic Research Service
FSA	USDA's Farm Service Agency
IFTF	Intermodal Freight Transfer Facility
IPM	Integrated Pest Management
MEC	Maine Central Railway
MM&A	Montreal, Maine and Atlantic Railway
MPG	Maine Potato Growers Cooperative
NASS	USDA's National Agricultural Statistics Service
NB	New Brunswick
NISA	Net Income Stabilization Accounts
OEEAA	Office of Economics, Environmental Analysis, and Administration
OTA	Organic Trade Association
PAR	Pan Am Railways
PEI	Prince Edward Island
PLA	Polylactic acid
PMIF	Potato Marketing Improvement Fund
QUE	Quebec
RPE	Russet Potato Exchange
STB	Surface Transportation Board
TOFC	Trailer on Flat Car
USDA	U.S. Department of Agriculture
USPB	United States Potato Board
VFD	Variable Frequency Drive
WPVGA	Wisconsin Potato and Vegetable Growers Association
WWF	World Wildlife Fund

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