

NEBRASKA POTATO EYES

Technical News Reports for the Nebraska Potato Industry

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Extension Potato Specialist

Editor's Note:

Spring, 1991 is proving to be a very wet period. Seed decay problems have been reported along the Platte River and on the edge of the Sandhills. This is a year to see if the seed dusts really work. The first estimates of Nebraska's potato acreage indicated an increase over 1990. The increase seems to be in tablestock and chipping potatoes. A slight decrease in the seed and french fry potatoes is possible.

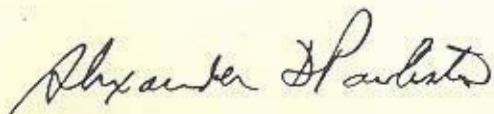
Nebraska is decreasing potato stocks faster than the rest of the nation (see article "Fall Potato Stocks") which is a sign of the peoples' confidence in Nebraska/Wyoming quality.

Western Potatoes Inc., Alliance was honored this year by Frito-Lay. Dale Moore and Louis Knoflicek were presented Frito-Lay's 1990 National Seed Grower of the Year Award. See following story.

There is a new university potato man in Wyoming, Dr. Gary Franc (see article). During this season, we will visit the Wyoming growers in Laramie and Goshen counties. He will also speak at the next Nebraska Potato Focus.

I often get asked by growers about new potato cultivars, their uses, and their performance. So, this issue is the inauguration of a new column. It will be about new varietal releases that either already are or have a good potential for use in this region (NE, WY, KS, SD, and northern CO). Each cultivar review will be authored by one of the cultivar breeders. The first is GEMCHIP by Dr. Joe Pavsek of the USDA at the University of Idaho. I hope that you will find this useful in planning and familiarization.

In the summer issue, there should be a tentative list of the speakers and topics for the next Potato Focus, December 10 and 11. The reports from last year's NPF are printed and will be mailed to all attendees shortly. For those who did not attend, the reports will be on sale after the mailings. Notice will be given in the next issue.



Western Potatoes Honored by Frito-Lay

Stacy Wehr
Frito-Lay, Plano, TX

Frito-Lay, Inc, the nation's largest marketer and manufacturer of snack chips, has selected Western Potatoes, Inc. of Alliance, Nebraska as its 1990 National Potato Seed Grower of the Year.

Western Potatoes Inc. farms more than 2,200 acres in Nebraska, Colorado, and Kansas, and is Frito-Lay's largest supplier of potato seed. The corporation has been a Frito-Lay supplier for more than 15 years, providing the company with seed development as well as the actual farming of chipping potatoes.

"Western Potatoes remains one of the most frequently requested seed sources by Frito-Lay's chip growers," said Fred Flieler, director of Potato Purchasing. "Their performance over the years has been outstanding, and we're pleased to honor them with this award."

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Western Potatoes Honored by Frito-Lay

Western Potatoes was selected from more than 30 other Frito-Lay seed suppliers. Criteria included quality of potato seed, operational efficiency, innovation, and improvement of seed varieties and service. The company was honored in March at a ceremony at Frito-Lay's Plano, Texas headquarters.



Jerry
Martin

Dale
Moore

Louis
Knoflicek

Paul
Voglewede

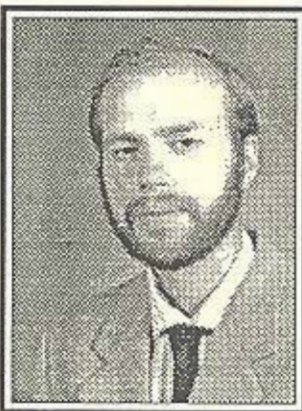
Congratulations! Dale, Louis, and all at Western Potatoes.

New Spudman in Wyoming

Alexander D. Pavlista

Extension Potato Specialist

University of Nebraska, Scottsbluff, NE



Dr. Gary D. Franc joined the Department of Plant, Soil, and Insect Sciences at the University of Wyoming, Laramie, WY. His primary extension responsibility will be to supervise the plant disease identification clinic and to develop educational programs addressing plant pathology-related problems found throughout the state. He will also continue research on potatoes and will

develop projects on bean and sugarbeet pathology.

Gary previously worked with Dr. Monty D. Harrison under whose guidance he completed his Ph.D. in 1988. His dissertation was entitled, "Long Distance Transport of *Erwinia carotovora* in the Atmosphere and Surface Water." He received the National Potato Council Auxiliary Scholarship in 1986 for his work on potatoes and his dissertation research was featured on the children's television program, "Mr. Wizard", as well as CNN's "Science and Technology Week". Gary was most recently employed as Area Extension Agent (Potatoes) for Colorado State University before coming to Wyoming.

Fall Potato Crop

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The USDA has estimated the fall crop to be 342 million cwt, up 5% from last year. The average yield in the USA was 298 cwt/a. Prices for better grades and larger US #1 potatoes (fresh market and processing) were below last year. The U.S. average grower price over all potatoes in October 1990 was \$4.97 about the same as the previous year. Prices in May are expected to be about \$7.00 on the average; this is \$2.50 short of last year.

On another note, Nebraska has moved from ranking 17 in the nation in potato production in 1988 to ranking 13 in 1990. Overall production was 3.54 million cwt total and 2.84 million cwt in fall potatoes.

Potato stocks in the USA totaled 54.4 million cwt on May 1, 1991, up 7% from 1990 and 8% below that of 1989. Disappearance of stock from the start of harvest through April was a record high of 282 million cwt. Shrinkage and loss to date was estimated at 26.0 million cwt, 11% above last year and 9% above 1989.

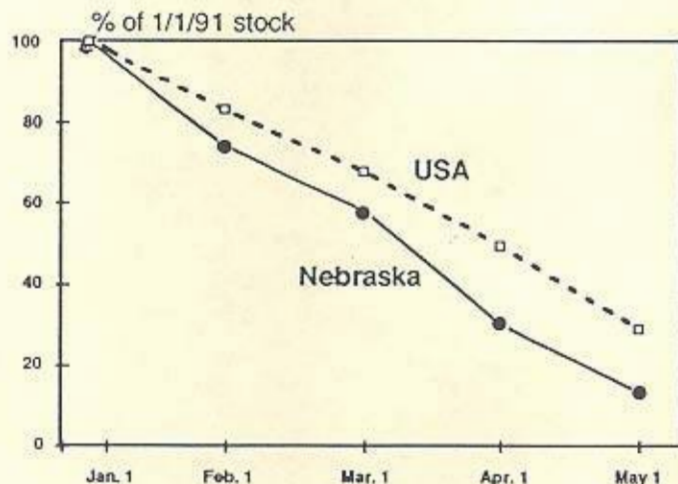
On June 1, 1991, 54.6% of Nebraska's fall potato production was in storage, and 55.4% of the U.S. fall production was being stored. On May 1, 1991, 7.4% of Nebraska's fall potatoes were still in storage while 16.2% was being stored throughout the nation.

(Information taken from the USDA and from "Nebraska Agri-Facts".)

Fall Potato Stocks as % of stock on 1/1/91.

For USA, 100%=186,160,000cwt.

For Nebraska, 100%=1,550,000 cwt.



Hairy and Black Nightshade

Bob Stougaard

Extension Weed Specialist

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Robert Wilson

Extension Weed Specialist

University of Nebraska, Scottsbluff, NE

Nightshades are being reported more and more frequently as problem weeds in Nebraska. The problem has migrated east from Illinois and Iowa and west from Idaho and is catching up with us. The problem is most apparent in beans, where standard broadleaf herbicides have controlled many troublesome weeds and in the process eliminated competition that had kept nightshades in check.

Two species of nightshades are common in Nebraska, Hairy nightshade is found in western Nebraska and eastern black nightshade is found in the eastern part of the state. Leaf shapes are similar. Hairy nightshade leaves are covered with fine hairs, whereas eastern black nightshade leaves have only a few hairs. The fine hairs on hairy nightshade give the leaf a silvery gray color and may be "sticky" to the touch. Eastern black nightshade leaves are dark green in color and usually have "shot holes" from insect feeding.

Hairy nightshade is an annual and is usually prostrate in growth habit. Eastern black nightshade may act as an annual or shortlived perennial; it may have an erect or spreading growth pattern. The mature deep blue or purple berries are sometimes used for making jams and pies; however, the green immature fruit may be poisonous to man and other animals. Green plant parts and the fruit of nightshade contain toxic glycoalkaloids called solanines which are poisonous. Numerous cases of black nightshade poisoning have been reported in cattle, sheep, swine, horses, chickens, and ducks. The toxicity of a given nightshade species may vary over wide limits with environment, plant part and degree of maturity affecting toxicity.

Besides being poisonous, the berries present additional problems with harvest and crop quality. Nightshades are frost tolerant and, therefore, stay green into the harvest season. When nightshades are harvested, the green foliage and juice from ruptured berries can foul combine harvesters and make harvesting impossible.

Nightshades reproduce from seed. Research from Minnesota showed that a single eastern black nightshade plant can produce as many as 7,000 berries and 800,000 seeds when grown without competition. The seed can remain viable in the soil for up to 39 years and can emerge from a depth of two inches. The seeds readily germinate when soil temperatures are between 68 and 100 F. Consequently, nightshade germinates from spring

through summer. Those nightshade plants which emerge even in midsummer are capable of producing seed but the amount of seed produced declines as the plants germinate later in the season. Research from Minnesota showed that eastern black nightshade produced less than 85 berries per plant when planted in May, 0 to 3 berries when planted in June, and no berries when planted in July. However, if the canopy is defoliated in July from hail or insect feeding, nightshade planted in May produced up to 1,600 berries per plant. This implies that nightshade have the ability to adapt very quickly to the light made available after crop leaf senescence.

Crop competition is a means of keeping a nightshade problem in check. This is also substantiated by the fact that nightshade plants growing in the row are smaller and produce less berries than those plants growing between rows. Nightshade competes with the crop primarily for water and nutrients. However, competition for light can reduce nightshade problems.

Nightshades can be controlled in crops through the use of herbicides such as Eptam, Dual and Turbo (Sencor + Dual). For a review on available nightshade control practices, refer to Robert Wilson's article "Nightshade Control in Potatoes", in the Nebraska Potato Eyes, March 1989 (pages 2 and 3 of vol. 1, issue 1)

Sandbur Note: In the last issue, some herbicide control treatments were discussed. In addition to those mentioned (Poast, Prowl, Treflan, and Dual), Eptam or Genep will provide excellent early season control.

Pesticide Residue Monitoring in Foods

Larry Schulze

Extension Pesticide Coordinator

University of Nebraska, Lincoln, NE

The Food and Drug Administration (FDA) continues its important role of monitoring pesticide residues in foods and food products. Its third annual report presented the results for the year October 1988 through September 1989. Results in this and the earlier reports continue to support the observation that levels of pesticide residues in the United States food supply generally are well below established safety standards.

A residue is that quantity of a pesticide that is present after application. A tolerance is the maximum residue concentration legally allowed for a specific pesticide in or on a particular raw agricultural product, processed food, or feed item.

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In 1989, the FDA collected 18,113 random samples and analyzed them for the presence of 270 pesticides. Both domestic and foreign food samples were analyzed. The largest numbers of domestic samples were collected from the main agricultural states. Shippers from 88 countries were collected and analyzed; the largest numbers of imported samples were collected from Mexico.

Less than 1% of the surveillance samples contained pesticide residues that exceeded EPA tolerances.

A Total Diet Study was also conducted by the FDA. This approach to pesticide residue monitoring provides an estimate of the dietary intake of pesticide residues for several age/sex groups. The estimated intakes of pesticide residues obtained were well below the standards established by both the United Nations Food and Agriculture Organization and the World Health Organization.

The majority of the violations (73%) occur because of apparent use of a pesticide on a particular commodity for which there is no tolerance, although the pesticide is registered for use on other foods.

Note that vegetables with pesticide residues above tolerance (violations) occurred mostly in samples imported from outside the USA. This was also true with grain, fruit, nut, oil, and drink samples. Yes! the US food production is among the safest in the world.

North Central Region Potato Variety Trials

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Potato Breeder

North Dakota State University, Fargo, ND

The North Central Regional Potato Variety Trials have now been in existence for the past forty years. In 1990, there were 16 states and provinces conducting trials. The trial in Louisiana was lost due to flooding and wet weather conditions. New Jersey entered the NCR Trials in 1990.

Soil type ranged from clay loam to sand. Most trials were grown on light sandy loam. Several locations used irrigation. It was wet in IN and MO and dry in ND and during some periods in Manitoba. In general, temperatures were not as high in 1990.

Maturity: Norland was once again the earliest maturing entry in the trials, followed by ND1196-2R and ND2008-2. Russet Burbank and Wisc 856 were the latest maturing entries.

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Spudders

Gary Leever

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The subject of this article will be the 1991 Florida winter test and information on varieties and seed lots for the 1991 crop. The Nebraska winter test plot was in Homestead, FL. Our acreage was again planted



in connection with the University of Wisconsin on the Joe Borek, Jr. farm. Although the plots had sufficient foliage growth to make adequate

reading, they were very poor compared with the ND, MN, NY, and ME plots. I have been informed by Wisconsin that they will not be planting their plots with Mr. Borek any longer so at this point in time I am not sure where our winter test plot will be planted in 1991-92. As most of you are well aware, Nebraska seed lots, with the exception of the variety Russet Norkotah, were in very good shape in regard to disease content. Russet Norkotah, a variety that was released by North Dakota only a couple of years ago, has come under fire by the entire seed industry due to its problems with potato virus Y or mosaic as the disease is commonly called. Norkotah, for one, is very susceptible to this virus, and complicating the matter, it shows either no or very, very mild visual symptoms. So detection of mosaic virus concentration has to be done with Elisa testing. Unfortunately many seed lots of this variety that had been imported into Nebraska failed the Florida test. That was the bad news; the good news was that the seed lots developed in Nebraska through the tissue culture method were clean.

Total and US No. 1 Yield: Red Pontiac was once again the highest yielding entry in the trials. For the past forty years of trials, Red Pontiac has generally been the highest yielding entry. Other high yielding entries were Wisc 870, Wisc 877, and Wisc 856. Alberta, MI, MN, and WI produced the highest yield. Mich 402-8 and Red Pontiac produced the highest percent U.S. No. 1. As usual, Russet Burbank had the lowest percent U.S. No. 1 and this as due mainly to growth cracks, roughness, and second growth.

Percent Total Solids and Chip Color: Wisc 870 and Wisc 877, with an average of 22.3 and 22.2 percent, respectively, had the highest percent total solids of all entries in the trials. Red Pontiac and Norland had the lowest percent total solids. The best chippers were the three Wisconsin entries — Wisc 856, Wisc 870, and Wisc 877. Other good chippers were Mich 401-1, ND2008-2, and Minn 13740.

Overall Merit: The top five entries in order were Wisc 870 (white), LA 12-59 (red), Wisc 856 (white), ND1538-1 Rus (russet) (note, ranked 6th in 1989), and ND1196-2R (red).

In 1989, Minnesota released Eide Russet, MN10874. The parentage is WC325-1 X Norgold Russet.

NCR Trial, 1991 - The cultivars that will be tested in 1991 are: **russets** - R. Burbank, Norgold R., and ND1538-1 Rus, **reds** = Norland, R. Pontiac, LA12-59, MN12966, MN13035, and ND1871-3R **whites** = Norchip, MN12567, MS401-1Y, MS402-8, W856, W870, and W877. In Nebraska, Atlantic and MN13540, a purple-skin cultivar, will be added.

North Central Regional Trials Results, 1990
16 locations average Nebraska data

<u>Cultivar</u>	<u>Yield cwt/a</u>	<u>Solids %</u>	<u>Yield cwt/a</u>	<u>Solids %</u>
Norland	250	16.4	218	17.1
Red Pontiac	399	16.4	398	17.3
LA 12-59	311	19.0	272	21.2
MN12966	257	18.3	196	20.1
ND1196-2R	289	16.7	293	18.4
Norgold R.	268	17.8	187	19.4
R. Burbank	299	19.3	177	19.0
ND1538-1 Rus	324	18.2	293	20.5
Norchip	291	19.5	320	19.9
MN13540	292	17.8	255	18.8
MN13740	297	19.1	303	19.7
MS401-1	279	20.5	325	20.9
MS402-8	169	18.4	160	20.5
ND2008-2	280	17.7	226	18.4
W 856	326	19.4	308	18.8
W 870	325	22.3	361	22.2
W 877	263	22.2	279	20.7
Atlantic	-	-	420	22.0
Averages	289	18.8	285	19.7



Labor Records

Ray Massey

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As field work gets into full swing, producers begin to hire seasonal help again. Apart from the tasks of hiring, training, and supervising farm employees it is important not to forget to keep adequate records on your employees.

There are two types of employee records important to agricultural producers. First, production records are important in order to give management information necessary for competitive production. Record not only cash and non-cash wages given to employees but also the employer portion of social security, insurance premiums covering the employee, the value of such things as housing, meals, and the personal use of auto and facilities. Use this information to 1) inform the employee of your true cost of hiring, 2) determine your production costs and efficiency, and 3) managerial planning when decisions such as expansion or alternative crops are being made.

Second, every employer has a legal obligation to maintain certain records about their employees. For each employee, the employer must maintain a record of their 1) name, address, and social security number, 2) Employment Eligibility Verification Form I-9, 3) cash and non-cash wages paid, and 4) social security, state and federal income taxes withheld and deposited with the proper government agency. When hiring minors, the employer must keep 1) a copy of a tractor or machine operation program certificate of completion, for persons under 16 years of age operating hazardous equipment, and 2) the written consent of the parent, for all employees under 14 years of age. It may be wise to protect yourself by maintaining a certificate proving the age of any minors employed. All of these records should be kept for at least four years.

The U.S. and Nebraska Departments of Labor, the Internal Revenue Service, Nebraska Department of Revenue, and your County Extension office have materials that will assist you in knowing which records must be kept and how to begin keeping them.

Cultivars: Gemchip

Joe Pavek

USDA-Potato Breeder

University of Idaho, American Falls, ID

The Agricultural Research Service, United States Department of Agriculture and the Idaho, Washington, Oregon, and Colorado Agricultural Experiment Stations announced the release of the potato variety GEMCHIP in 1989. GEMCHIP is released for chipping from the field and from storage.

GEMCHIP, tested as BR7093-24, was selected from the cross BR5960-9 X ND5737-3. Initial selection was done by R.V. Akeley, USDA-ARS, and C.E. Cunningham, Campbell Institute for Agricultural Research, at Presque Isle, Maine with subsequent testing and selecting done by USDA-ARS and state cooperators in the Western U.S. GEMCHIP is of medium-late maturity and has a medium sized vine. Its tubers are round to oblong, with a light tan, smooth skin.

GEMCHIP has been tested extensively in the uniform Western Chipping Trial and the National Snack Food Association Chipping Trial; combined results of these and other trials for the four states show high yields and specific gravity over Norchip.

Summary of Properties:

Purpose — chipping variety for irrigated fields in the western states

Maturity — late

Vine — medium sized, upright

Leaves — dark green

Tubers — round and oblong; thin, white, smoothed skin

Set — uniform, low to medium (8 to 10)

Specific gravity — medium, better than Norchip

Sugar — low

Chip color — like Norchip

Bruising — more susceptible than Norchip (blackspot & shatter)

External defects — rare

Yields — 25% higher than Norchip in CO, ID, OR, and WA

Diseases — resistant to early dying/Vert. Wilt, and to foliar early blight, and susceptible to scab

Other — needs less N than R. Burbank (lower critical nitrate levels in petiole), slightly sensitive to Sencor/Lexone, longer dormancy than Norchip

Mean tuber yields and specific gravities for western replicated trials, 1982-88.

GEMCHIP

Location	U.S. Location -years	Total cwt/a	No 1 cwt/a	Specific gravity
Idaho	7	384	339	1.087
Washington	6	645	530	1.079
Oregon	4	574	502	1.079
Colorado	3	375	323	1.093
Means		495	424	1.085

NORCHIP

Location	U.S. Location -years	Total cwt/a	No 1 cwt/a	Specific gravity
Idaho	7	324	244	1.082
Washington	6	533	405	1.080
Oregon	4	436	344	1.080
Colorado	3	304	239	1.079
Means		399	308	1.080

Idaho Potato School #23

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The 23rd annual Idaho Potato School was held in January, 1991 at Pocatello, ID. The following are selected highlights from the Proceedings which are of interest to Nebraska growers. Anyone wishing to go through the Proceedings, please contact me.

Diseases:

Seed Decay — Several chemical seed treatment products are available at differing prices/cwt of seed. TBZ (Mertect) and Tops are the most effective Fusarium dry rot control chemicals. It has been found that in some instances neither product provided adequate disease control in pre-cutting situations. The advantage of TBZ and Tops products has been the control of tuber Rhizoctonia and Fusarium dry rot with some indirect control of Erwinia bacteria (soft rot & blackleg). Note TBZ (Mertect) can no longer be used on cut seed (NPE 2-3).

The degree of control with any chemical treatment will be reduced as the pathogen population increases. Captan and Mancozeb chemicals are effective at lower Fusarium populations but may fail to provide sufficient protection when contamination levels are very high. TBZ and Tops products generally perform well even at high pathogen levels.

One chronic barrier to good control is getting 1 lb of chemical to adhere to the seed piece. University of Idaho research has shown that the percent adhering to the seed piece can drop below 65%. Gustafson is testing a TOPS 5% dust with a label recommendation of 0.5 lbs/cwt.

Seed Piece Treatments, 2 years results in ID on R. Burbank (Miller Research, Inc.)

Stand	% Seed	% Decay	% Rhizoctonia	% Blackleg
Check	79	89	42	40
Captan, 7%	84	47	55	2
TOPS, 2.5%	91	20	25	0
TBZ, 0.5%	91	20	35	0

Cover Crop — Sudangrass as a green manure treatment has been outstanding in the suppression of early dying caused by *Verticillium dahliae*. Colonization of potato roots was greatly suppressed. Green manure treatments with corn also reduced colonization. With wilt reduction, yields of R. Burbank potatoes in Idaho were increased and there occurred an increase of U.S. #1 tubers. Without the presence of *V. dahliae*, there was no yield benefit due to cover crops. A potential problem was also noted. Following the use of the treatments, there was a rise in the lesion nematode population (*Pratylenchus neglectus*). Furthermore, the specific gravity of R. Burbank tubers were reduced by rape as a cover crop.

Yields of R. Burbank in ID Following Green Manure Treatments

	Total US #1 ———— cwt/acre ————	>10 oz
Fallow	132	21
Sudangrass	230	99
Corn	198	67
Oats	180	58
Rye	177	39

Weeds: A survey of growers in southern Idaho indicated that nightshade was considered the most troublesome weed followed by Canada thistle, wild oat, and kochia. The most used herbicide was metribuzin (Sencor or Lexone), used by 91% of responding growers. Eptam was next (83%) and, then, Prowl (34%).