NEBRASKA POTATO EYES

Technical News Reports for the Nebraska Potato Industry

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Editor's Note

Planting is active at a hectic pace in Nebraska. Lots of rain has come down this spring bringing needed water to the soil but also delaying planting. Nebraska's potato acreage has increased from 12,000 in 1989 to 14,000 approximately in 1990. Potato production for chips and fries account for the bulk of this increase. Spring potato stocks in the country are very low. As of April 1, stocks are 10% less than 1989 and 21% less than 1988 (refer to following table taken from the TABB potato service and the USDA).

Our "Nebraska Potato Focus 1989" received some national publicity in SPUDMAN (April 1990). A number of the attendees from other states felt the meeting was so useful that they will spread the word to growers among our neighbors. The meeting was an all around success and 1990 is shaping up to be better. The proceedings of the last meeting are still in preparation and should be sent to all participants soon.

Seventy six people attended in December 1989 about three quarters were potato growers. Besides Nebraska, growers from Wyoming and Colorado attended. Representatives from the agrichemical, agriequipment and potato processing industries were available. The conference included ten exhibitors, eleven speakers, and a tour of Lockwood Corporation.

At the end of the conference, an evaluation form was sent to all participants. Twenty were returned, 14 from growers, 2 consultants, 3 industry reps., and one sole government/university staff member. Summaries are included.

The meeting in general was rated good to excellent by 80 to 95% of the respondents. Those indicating a preference wished to see it held earlier and be longer. Over 80% of those expressing an opinion rated the presentation good to excellent. All the comments showed an interest in more speakers especially from out of the area. About 80% of the growers liked having exhibitors and found them useful. A couple of growers wanted to have more, 10 to 15.

The two items that the evaluators liked most about the meeting were: 1) the opportunity to meet and exchange ideas among each other and 2) the information that was available. A couple of growers emphasized the diversity of the information as a big plus. For the least liked item about the meeting, the overwhelming vote getter was the weather–snow. Note, in 1990, it will be in November. Comments included using the auditorium for better sound and seating, making the meeting longer, and improve dinner. Other suggestions expressed were to annually present variety information and trial results, bring in key experts from out of state and highlight specific recommendationsas appropriate. Workshop–like concurrent sessions were also noted. I don't think that we are ready to implement this approach yet; however, I would like to hear more about this from growers. A couple of growers asked for two meetings a year. I would like to note that in May/June, there is the Nebraska Potato Council and the Potato Certification Association of Nebraska joint meeting.

Spring Potato Stocks
(in million cwt, USDA source)

	1988	1989	1990 (4/1)
US	106	92.6	83.5
CO	8.1	7.4	7.5
ID	40	40	35
ND	6.9	3.3	3.6

In This Issue...

You should have received a notice. This annual event is usually a half day, but, with interest, it could be expanded.

Several people suggested guest speakers for the future. Heading the list are Bob Thornton (WA) and Warren Trank, some of the others are Duane Preston (MN), Bob Johansen (ND), Dick Chase (MI), John Taberna (ID) and representatives from processing and seed production.

The evaluation asked for opinions on topics for future meetings. The principal topics of interest were cultural practices/equipment and environmental influences/ climatology. Two areas were especially emphasized by several growers. The first topic was growth, quality, and yield factors – fertilization, petiole analysis and soil sampling, chemigation, and pest control updates. The second encompasses breeding, new technology, seed production, sanitation, future of true potato seed, and variety trial update. Individual growers also suggested grower/processor relation, international export potential, new equipment, and area population trends (after 1990 census).

Most of these suggestions will be implemented in the 1990 and future potato conferences. The dates of the "Nebraska Potato Focus, 1990" is set for November 29 and 30, the Thursday and Friday after the Thanksgiving Day weekend. It will be held in the Auditorium at the Panhandle Research and Extension Center, Scottsbluff. The holiday dinner will be on Thursday night at the Scottsbluff Country Club, so mark your calendars.

EVALUATION SUMMARIES:

	Excellent	Good	OK	No Opinion
Meeting:				
Overall	11	8		1
Scope	5	13	1	1
Organization	9	7	1	3
Usefulness	7	8	3	2
Facilities	10	8	1	1
Time of year	5	9	4	2
Length	4	11	4	1
Presentation:				
Quality	8	6	3	3
Number	4	11	3	2
Length	3	12	2	3
Guests	6	11		3
Exhibitors:				
Having them	11	5	2	2
Type	6	8	3	3
Number	1	9	7	3
Location	4	11	2	3

TOPIC SUGGESTIONS:

	Interested	OK	Not Interested	No Opinion
Environmental Factor & Climatology	15	3	1	1
Cultural Practice & Equipment	18	1		1
Processing & Quality	10	6	3	1
Marketing & Economics	11	6	2	1
Management & Labor	11	5	3	1

Safety Task Force on Potatoes

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Michael Cranney
National Potato Council
Denver, Colorado

The National Potato Council and the National Potato Board have established a Food Safety Task Force. The co–chairs are Dave Long, Don Neb and Ron Walker. The task force has two immediate goals. First, growers from all producing areas will be trained in the proper and safe use of pesticides and fertilizers. Training will include dealing with and talking to the media as needs arise. The initial training seminar is scheduled for fall and 20 people will attend. The second goal is to find an independent spokesperson. The spokesperson will be informed about the safeness of potatoes and the tools of potato production. Part of the message to be publicized is that farmers, focusing on potato growers, are the most ardent and the first true environmentally minded people.

Chippers Perspective

Mike Eisenhauer
Weavers Potato Chip Co.
Lincoln, Nebraska

Potato supplies for the chip industry are far more plentiful than a year ago at this time. During March, April, and early May of 1989, chip processors across the country experienced the most severe shortage of chipping potatoes as we've seen in recent times. The severe drought during the 1988 growing season in major potato growing areas cut yields to 50% or less in some cases. Processors east of the Mississippi river depend on approximately 60% of their storage supply to come from the Red River Valley. Everyone knew the valley was way short long before the problem was compounded in early March when a late freeze hit the southern states. In south Texas, Alabama, and Florida harvest was delayed several weeks due to the freeze. Chip processors cut back production to stretch the storage supply until the new crop was ready for harvest. Chip promotions were suspended and chippers found it difficult to maintain shelf space in the stores. Potato prices soared as high as $25 per cwt. and some processors were buying almost any kind of potato they could find. Many of the processors used potato varieties not intended to be used for chips including seed potatoes. Quality and color standards in some cases were totally disregarded. Consumers found surprises in chip bags they will long remember.

This year new crop potatoes are coming in on schedule so far. Open market potatoes out of south Florida are running at $3.75 cwt. F.O.B at the time of this writing.

It is important for both the grower and the processor to understand each others problems and concerns. The problems growers encounter turn out to be problems for the processor as well and vice versa. It is extremely necessary for growers and processors to communicate and work together in resolving problems they each encounter.

Quality control starts with the seed before it is even planted and lots of things can go wrong during the growing, harvesting, and storage seasons as well as in transportation or processing. Good quality potatoes make good quality chips. It is impossible to make a good chip out of a bad potato. What the consumer sees when he or she opens the bag will probably be the decision maker as to whether or not they buy the next one.

The quality of Nebraska potatoes held up real well out of storage this season. External and internal defects were minimum and chip color was mostly good. New chip varieties being tested and evaluated is a continuing process. Sometimes it takes several years of testing before it can be determined if a variety will work in a certain area. Much improvement in chipping potato quality has been made in recent years. As long as growers and processors continue to work together and share in the risks involved, we can expect continued success in the future.

Certification Meeting

Gary Leever
Potato Certification Association of Nebraska
Alliance, Nebraska

The Certification Section of the Potato Association of America held their winter meeting on November 28, 1989 at Jackson, Wyoming.

The hot topic for discussion for potato certification people is how to handle transgenic varieties. Transgenic refers to a plant that has been genetically altered and manipulated. The problem that genetically manipulated material present to certification personnel is that the altering that takes place will have no visually identifiable characteristic. For example, a Monona, that was genetically engineered to have high gravity instead of low will still look exactly like a Monona in the field. No decisions were made on this issue and fortunately the bio–tech companies that are working on potatoes have not released any varieties yet. However, we will see some genetically altered potatoes in this decade.

Another item of great interest was a report from various Canadian scientists and certification personnel about the post–harvest testing for bacterial ring rot. Dr. Salke DeBore in B. C. has developed an antiserum that is usable to determine the presence of ring rot in the juice squeezed from large numbers of potato tubers. According to the Canadians, accurate test data are available on up to 200 tubers per test. The Canadian post–harvest test requires 400 tubers for a winter test plot in the south and 400 tubers for this ring rot test. Preliminary results seem very good and this system seems to be a major step in the detection of bacterial ring rot in seed lots.

The new chairman of the certification section is Jacques Laganiere of Agriculture Canada. The winter meeting of the section will be held sometime in the month of December in Vancouver, B.C.

Growers News:Babies

Congratulations to Jeff and Julie Swanson on their first child, Russell Walker. He was born on December 18, 1989 and weighed 8 lbs. Walker came before the holidays because he heard that his parents "got him everything".

Idaho's 22nd Potato School

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The Idaho Potato School was held on January 23–25, 1990 in Pocatello, Idaho. This year's attendance included several Nebraska growers – Dale Moore, Jeff, Jack, and Jason Swanson, Sam Jameson, Martin George, and myself. The following are highlights from my notes. Contact me for the Proceedings or parts therefrom.

Herbicides/Weeds:

Assert (American Cyanamid) is used on irrigated small grain to control wild oats. To prevent carryover into potatoes, water should be applied at 12 inches or more for one to two months into October.

Assert, Harmony, and Curtail (= Stinger) applied on small grains can drift to potatoes. Symptoms are:

	Assert	Curtail	Harmony
New Leaf Yellowing	+	+	+
Upward Cupping/Points	+	–	–
Scalloped Leaf Edges	–	+	–

Tuber injuries are 1) for Assert, cracks and kidney shape, 2) for Curtail, small sizing, and 3) for Harmony, creasing and cracks. Assert had the least effect on yield and Curtail (Stinger) decreased yield the most, showing the greatest phytotoxicity.

Hairy nightshade germinated throughout the season and is partially tolerant to Sencor (= Lexone).

Hairy Nightshade Emergence in Idaho

	April	May	June	July	August
% emergence	2	60	31	5	12
PP/PE Herbicide Control Period			//		

Percent Control in June in Idaho
(Applied after hilling)

	H. Nightshade	Foxtails	Pigweeds
	% control		
Eptam (4 pt) + Sencor (l lb), PPI	53	97	98
Dual (2 pt) + Sencor (5 lb), PE	96	100	99
Prowl (2 pt) + Sencor (5 lb), PE	95	99	99

Note: Turbo = Dual + Sencor

Pigweeds are getting resistant to Sencor/Lexone (10 X tolerance), therefore, the recommendation is to alternate herbicides year to year.

Fungicides/Diseases:

Fusarium is the #1 cause of seed decay. There are indications that effective control of Fusarium also suppresses black leg (Erwinia). Systemic fungicides such as Mertect and Tops are more effective than contact ones such as Captan and Maneb.

Seed Dust Treatments on Norgold in Idaho

	disease index	yield, cwt/a
Untreated	3.95	416
7.5% Captan	2.20	410
0.5% Mertec	2.59	422
2.5% Tops	2.28	424

	Fusarium	% stems with Rhizoctonia	Erwinia
Untreated	40	22	18
25% Fir bark	38	20	5
0.5% Mertect in bark	0	5	5
0.5% Mertect in Talc	2	5	5
2.5% Tops in Talc	0	6	5

Eight Year Yield Summary at Univ. of Idaho Research and Extension Center

Untreated	399 cwt/a	Tops (Alder bark)	417 cwt/a
Captan (Talc)	398	Mertect (Alder bark)	428 cwt/a
Maneb (Talc)	403	Mertect (Talc)	429 cwt/a

Black leg (Erwinia)—Tubers are infected. No smell is given off; when a smell is noticed, it is from a secondary infection. Blackleg gives a tuber soft rot, mushy like warm butter. This bacterial disease does not persist in soil but will survive in plant debris. During tuber storage, the blackleg bacteria enter tubers through small openings called lenticels. For every 0.8% disease incidence on seed pieces there is a 1% yield loss of Burbank potatoes. A 1% yield loss occurs with a 1.4% preemergence sprout decay and with a 6.2% postemergence vine decay.

Black leg bacteria likes free–standing water, not dry, and enters through the lenticels or wounds. Seed piece treatments do not handle this infection. Varieties vary in susceptibility but none are resistant. Monona and Red Chiefton are very susceptible. There is no correlation between years for infection. Rogueing doesn't help since there is no indication for the following year. There is no

correlation with tuber pulp temperature at cutting.

Fusarium and blackleg appear together. Controlling Fusarium will also decrease black leg incidence probably due to less wounding. A suberization (healing) period of 2–3 days in moist, warm, ventilated air will wall off the bacteria. Healing is best when using a sharp knife during cutting. Warm soils of 50°F promote emergence which decreases infection. Plant shallow and hill around emergence to build up root system and lessen dependence on seed piece.

Black Dot may be transferred by air–borne foliar infection. Symptoms include yellow, dropping petioles with lesions in the elbow. Small, black fungal colonies (Sclerotia) can be seen in elbow using a hand lens. A reddish discoloration can appear at the stem base. Symptoms are similar to that of Verticillium wilt. Black dot is associated with the early dying complex. The fungus will move down through the plant to roots and tubers. Foliar inoculations appear in the stem end of the tubers. There is seed to soil inoculation. Black dot is not found in virgin ground. Black dot even with few symptoms causes yield loss. Duplicating the natural population in infected soils resulted in a significant, 16% yield decrease. A survey of southern Idaho found black dot in the soil of 70% of the seed and all of the production areas sampled. Severe wilt will also reduce specific gravity. Early foliar application (June–July) of procloraz may control infection, but it is not yet available in the USA; it is a U.K. product (FBC Ltd). Currently, there are no control measures available.

Soil Temperature and Moisture:

High soil temperature causes malformed tubers and delays tuber growth. The combination of high temperature and low moisture of soils increase the proportional yield of #2 tubers, decrease specific gravity and cause more pointy–end tubers. High temperatures during tuber initiation may reduce sugar–end development.

Russet Burbank	% Grade			Specific
Soil Condition	US#1	US#2	Culls	Gravity
control	69	14	17	1.081
low moisture	53	29	18	1.082
low moisture/ high temp.	37	46	17	1.071
high moisture/ high temp.	39	46	15	1.068

New Popular Varieties in Nebraska:

Norkotah – tends to early die, needs best ground, sensitive to Sencor/Lexone, has little hollow heart, dies quick, can not store well, does poorly in blind taste tests but has high customer acceptance due to appearance.

Frontier – poor and slow row closure, therefore, a weed problem may occur, slow emergence, some blight resistance, few eyes per tuber (seed cut problem).

Shepody – can be scabby, is blight sensitive, has high percentage of large tubers.

HiLite – tends to accumulate sugar in storage and fry dark, susceptible to early die, sensitive to Sencor/Lexone.

New Technology:

Potato variety development using genetic engineering processes has been successful in introducing resistance. Most work is on viral resistance in potatoes. Examples are resistance to X, Y and leaf roll. Insect resistance is being developed with the incorporation of BT toxin genes against the Colorado Potato beetle. The current development of 2,4–D–resistant potatoes may allow the use of 2,4–D for nightshade and pigweed control.

Gene Incorporation	Strength	Weakness
Traditional, mating	Introduces uncharacterized traits such as tuber qualities	Can not deal with genetic complexity
Gene Engineering	Introduces specific traits such as viral resistance	Gene needs to be known, isolated, and transferrable

POTATO TRIVIA

Potatoes aren't just for dinner (or lunch or breakfast) anymore!

Stevens Point Brewery, Stevens Point, WI, has introduced Spud Premium Beer — brewed with the all-American potato.

A company in Nampa, ID, markets Purena, a hand cream made with potatoes.

And Al & Reed's, Inc., in Idaho Falls, ID, makes a sugarless, premium-style ice cream from potato flakes.

April Showers Bring May Flowers
In Potatoes April Plans Bring May Stands

SPUDDERS

Gary Leever

Potato Certification Association of Nebraska

Alliance, Nebraska

April is upon us and everyone is busy frantically shipping potatoes out while at the same time getting new seed. From a certification standpoint, sanitation is important in both shipping and receiving seed potatoes but probably at this point, more critical is receiving new seed. The storage area for the newly purchased seed should be disinfected along with trucks, pilers, metal air ducts, and any other equipment that was previously in contact with potatoes. A dilute Clorox disinfectant is recommended.

Also, don't forget to retain inspection records and seed tags from State of origin as these will need to be submitted with your acreage application for certification, due June 15. Remember your acreage applications can be filled out and sent to our office as planting progresses. You do not need to wait until all planting is complete before you send the information to our office.

Temik Withdrawn from Potato

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On April 10, Rhone–Poulenc (R–P) announced a voluntary, temporary withdrawal of Temik (aldicarb) use on potatoes. An audio news conference was held on April 12 by the EPA.

The following are highlights:

History — Temik is under review by the EPA for groundwater presence in certain areas. In a separate study three years ago, dietary considerations for children between 0 to 6 years were evaluated. A "market basket survey" for fruit and vegetables was done at the grocery store level. The highest residue observed was 0.18 ppm well below the 1 ppm tolerance level.

Recent finding – since residue analysis was performed on composite samples, R–P decided to look at residues of individual tubers taken and stored from the field. Twenty–six fields where Temik was used on white potatoes were sampled. Of these, 23 fields did not have a high enough residue to do a storage, degradation study. Of the remaining 3 fields, 100 tubers from each was sampled. In 2 of the 3 fields, all individual tubers analyzed below the tolerance level. Ten tubers of the 100 from the third field were above 1 ppm and one of these was as high as 9 ppm. What caused this high residue is currently not known. Misuse of Temik has been ruled out. Due to the water solubility of Temik, one hypothesis is that this sample came from a low spot in the field where water stagnated and, thereby, concentrated the chemical. This and other possibilities are being investigated by R–P. In the meantime, R–P recommends not using Temik on potatoes in 1990.

Food Concern — There is no food safety concern! Baking, boiling, frying, chipping, and any form of cooking reduces the Temik level to half. Furthermore, processing such as potato chips, french fries, and mashed potatoes involve blending of tubers, and therefore, a drastic dilution effect. Storage and washing of potatoes further reduces the level of Temik. The only danger would be a child eating a raw potato with a very high residue level. There is NO danger!

Symptoms — Temik has been used for over 17 years in the United States with NO reported cases of illness. For the record, symptoms of Temik exposure occurs within one hour. These symptoms are flu–like: headache, blurred vision, queezey stomach/nausea, and, in severe cases, vomiting. All symptoms usually disappear within six hours. Since it is a cholinesterase inhibitor, atropine can be used as an antidote. There is, however, no cause for alarm as there are no reported incidences of exposure.

The Recall — Rhone–Poulenc has stopped all sales of Temik. Unopened containers are to be returned for full refund. Stickers deleting potatoes from the label will be placed on all containers. It is anticipated that in 1991, this voluntary withdrawal will be rescinded.

Seed Seminar: An Inspector's Eyes

Kent Sather
Potato Certification Association of Nebraska
Mitchell, Nebraska

Where can a potato grower discuss future trends for the potato industry, hear about new research, see new commercial ideas, question other growers from across the nation, and learn to grow a better crop, all in one place? The answer is the North American Seed Seminar. The 1989 seminar was held in Idaho Falls, Idaho and they are getting better every year. Topics ranged from getting the edge in marketing to enhancing seed quality and performance.

On marketing, I heard about the need for a grower's integrity. Another point made was that we need to be ready for the fast–paced 90's. New varieties will hit the open market fast and with more variety patents than ever before.

Research topics covered potato early dying and ring rot. The underlying factor to reduce any disease has been and always will be planting of clean, certified seed. We reviewed different types of tuber rot symptoms and causes. Losses in quality and yield in relation to the leaf roll virus was also discussed. I listened intently when the subject of ring rot and lawsuits hit the podium. Many aspects and ideas were brought up. This is a summary of what I heard.

We, as certification agencies, in order to keep from being negligent in a lawsuit situation need to:

— use state of the art testing and confirmation of diseases.

— use random sampling and define what procedure is used to procure samples for testing.

— properly train inspectors and technicians for testing.

— possibly publish inspection results, because, compared to the standard, it may be negligent not to publish.

The 1989 Seed Seminar was not just a meeting. There was a lot more to it than that. One could relax in the hotel pool. One could cross country ski at the base of the Tetons. One could tour a potato related industry in a different part of the country. All of this centers around information about the ever changing challenge of raising potatoes. The only way to improve the Seed Seminars is if you participate next time!

By the way, the next seminar is planned for Miami, Florida in January, 1991. Nebraska's southern test plots are sure to be on the tour.

Growers News:Donations

West Nebraska Potato Shippers made a donation of $2,000 to the Bridgeport Park Board for a new swimming pool last December.

Picture furnished by the Bridgeport News-Blade