

NEBRASKA POTATO EYES

Keeping an Eye on the Nebraska Potato Industry

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This is the first issue of the Nebraska Potato Eyes, a newsletter for the Nebraska potato growers. The purposes are to promote communication between all parties interested in the potato industry in Nebraska, to report information learned at meetings, to present information on growers' concerns and questions, and to alert happenings related to the industry. Since becoming the Extension Specialist on potatoes in December 1988, I met with many of you. For your cooperation and warmth, I thank you all - Dale Moore, Gene Shaver, Jack Nielson, Rich O'Bannon, Connie Lapaseotes, Jeff Swanson, Edna Fisher, Lloyd May, Larry and Leon Regier, George and Reed Kuroki, Rollin Packer, Butch Thompson, Arnold and Linda Jensen, Pat and Mike Chrisman, and Stan Schaneman. I hope to have met all the potato growers by planting season. Among my objectives to serve you are to get a complete picture of the potato industry in Nebraska, to identify the pest situation across the state, and to learn of your concerns and interests. With the interviews already conducted, it is clear that the potato acreage in this state is underevaluated by reporting agencies. Instead of 8,000, there were 12,000 or so acres in 1988. Our potato industry covers tablestock (reds, russetts, and whites), seed, chip, and, recently, fries. After I finish meeting you, I will summarize the highlights and we will have a look in the "mirror".

Potatoes and Aldicarb

Following is a statement by The Potato Board on the recent publicity regarding potatoes and aldicarb:

The Potato Board and its 13,000 + members are greatly concerned about recent news reports

containing allegations about the use of aldicarb on certain food crops, including potatoes and bananas. The Board and its members are further concerned that these allegations may be inaccurate and could undermine the confidence consumers currently have in our nutritious potato supplies.

Producing a healthful and nutritious potato product has always and will continue to be the primary goal of all potato growers throughout the United States.

The Environmental Protection Agency (EPA) has not made a copy of this preliminary report available to the Potato Board. As such, we have not had the opportunity to review and analyze the report, and are therefore unable to review the specific findings at this time.

The Potato Board has always and will continue to rely on information supplied by the EPA. We do, however, urge the EPA to review these allegations carefully and quickly to allay consumer fears that may have resulted from these allegations about the safety of the nation's food supply.

Aldicarb, when licensed and applied properly to the potato crop, is safe and leaves no harmful pesticide residues. In 26 years of registration and use, there have been no documented cases of illness attributed to the use of aldicarb on potatoes.

The EPA has established safe residue levels for the use of aldicarb on potatoes and a variety of other food crops. These standards have been designed to allow for wide, built-in safety margins.

*Editor's note: Aldicarb is Temik
(Rhone-Poulenc)*

Crop Improvement Days

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Crop Improvement Days were held at Grand Island on January 16 and 17. The meeting was well attended and emphasis was on small grains, corn, and soybeans.

Ken Vogel (USDA-UNL) discussed the basic dichotomy of genetic resources. Public groups, such as land-grant universities, develop new knowledge for all, train people and improve crop varieties. In the private sector, such as seed companies, the emphases are on profitable varieties and competitive knowledge. The questions of germplasm ownership came up. Who owns it? For how long? How much does it cost? These questions are being asked in the grain and bean industries. They are coming to the potato industry as well. We are already seeing proprietary activity such as with seed production of certain chip varieties. Walt Fehr of Iowa State University presented the situation and arguments in favor of charging royalties to growers for new varieties.

Darrell Nelson, Dean of the Agricultural Research Division, presented the current position of the University of Nebraska. UNL supports non-exclusive release of university-originated agronomic crops and, therefore, there are no royalties. With respect to horticultural crops such as potatoes, if the variety release committee recommends exclusive release in order to gain acceptance of a variety, then the University can, not necessarily will, collect royalties. The Nebraska Crop Improvement Association will collect royalties on seed of varieties developed by other Universities who routinely charge a royalty even though nonexclusive release has occurred. However, very few Universities are asking for royalties. The great bulk of varieties from the public domain are not subject to royalty collection.

On another note, Dave Buchholz of David, Jeffrey & Association talked about public relations and how it helps business grow. A key concept presented was the Unique Selling Propo-

sition (USP). A USP is that distinct idea that sets one apart from all others. This can be applied to a person, a company and to a state's industry. To help continue and advance the growth of the Nebraska potato industry, the development of a USP is a successful tool. We have seen how some states have developed a USP and have grown to dominate the potato industry. Let us think about this concept and how it applies here.

Trivia Question - When and by whom was the first plant gene patented?

Answer - 1986 by Molecular Genetics Inc.

Nightshade Control in Potatoes

Robert Wilson
Extension Weed Specialist
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Over the last several years potato growers have complained about the poor herbicide control of hairy nightshade in potatoes. The problem has increased as the use of metribuzin, the active ingredient in Sencor and Lexone, has increased. Metribuzin is a valuable tool for weed control in potatoes but has the weakness of providing limited control of black and hairy nightshade. Nightshade is a member of the plant family Solanaceae of which the potato is also a member. Since nightshade and potato are closely related it is not surprising that herbicides selective to potato have limited activity on nightshade.

To solve the nightshade problem in potatoes it may be helpful to first examine the herbicides and cultural practices available to growers for weed control. The following herbicides are labelled for weed control in potatoes; Dacthal, Diquat, Dual, Eptam, Gramoxone Super, Lexone, Lorox, Poast, Prowl, Roundup, Sencor, and Treflan. Diquat, Gramoxone Super, and Roundup are labelled for weed control early in the season prior to crop emergence. These herbicides are non-selective, have no residual weed control properties and usually do a good job of controlling broadleaf (nightshade) and grass weeds when they are very small, but must

be applied before crop emergence.

Grasses emerging in potatoes after the crop is up and growing can easily be suppressed with Poast, however, Poast has no activity on broadleaf weeds. Prowl, Treflan, and Lorox provide control of grasses and some broadleaves such as pigweed and lambsquarters. These products may be applied before crop emergence, control only weeds which have not emerged, and provide only 50 to 60 percent nightshade control. Dacthal can be applied at planting, drag off and as a layby treatment after crop emergence and controls lambsquarters, kochia, and grasses and provides about 70 percent nightshade control. Eighty percent nightshade control can be obtained from Eptam or Dual applied at planting, drag off, or as a layby treatment. None of the herbicides labelled for potatoes will control all of the nightshade present, however, Dual and Eptam have the best nightshade activity. Both Dual and Eptam are labelled for tank mixing with metribuzin (Sencor/Lexone) and together will provide a broad spectrum of weed control. Growers may also wish to utilize a herbicide treatment applied at planting and combine it with a second treatment applied postemergence or layby to extend the period of nightshade control. This program works well with most herbicides except Eptam. When Eptam is applied to the soil, microorganisms present in the soil begin to degrade the herbicide. If Eptam is repeatedly used soil microorganisms will rapidly degrade the second Eptam application. Therefore, if a grower wanted to apply two herbicides for nightshade control it would be better to apply Dual at planting and follow with Eptam layby or apply Eptam at planting and follow with Dual layby. For further information on herbicide rates, timings, and precautions consult the herbicide label and A 1989 Guide for Herbicide Use in Nebraska.

Several cultural practices are valuable in controlling nightshade. Nightshade is easy to control in corn, small grains, and alfalfa and, therefore, controlling nightshade in crops rotated with potatoes can be helpful in reducing weed density. Cultivation can also be a valuable tool in reducing early season nightshade populations

since small weeds can easily be controlled with timely cultivations. Growing potatoes in narrow rows or planting varieties with early season vigor will allow the plant to cover the inner row earlier in the season and reduce the competition from nightshade emerging later in the season.

WSSA Meeting

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Weed Science Society of America held their annual meeting on February 6-9 in Dallas, Texas. The following are potato highlights taken from the "Abstracts".

One redroot pigweed plant per 1 yard within the potato row reduced the yield of Atlantic tubers by 15%. Two and four pigweeds per yard of row reduced tuber yield 28%. The presence of pigweed did not significantly affect specific gravity. Pigweed emergence between rows and after potato emergence did not significantly affect yields. Pigweed control in potatoes is needed before potato emergence. Current recommendations for pigweed control by the Nebraska Cooperative Service is Sencor (Lexone) applied Pre.

There is an increasing amount of testing of Tough (pyridate) for the control of nightshade, pigweed, and barnyardgrass. In tomatoes, Tough plus Sencor applied as a directed postemergence spray controlled small seedlings of eastern black nightshade. No residual control was observed. The most promising preemergence control of nightshade in tomatoes was reported to be Dual (metolachlor).

Grower News

Larry and Kristi Regier, congratulations on your new daughter, Karissa. She was born at coffee break, 10:30 a.m., on January 30, a healthy 7 lb. 2 1/2 oz.

Fusarium Seed Decay

Eric Kerr

Plant Pathologist

Panhandle Research & Extension Center

Several *Fusarium* spp. are causative agents for disease in potato. The diseases are commonly classified as Fusarium dry rots and Fusarium wilts. Each of these diseases are generally caused by different *Fusarium* species. *Fusarium solani* and *Fusarium roseum* are mostly associated with Fusarium dry rots.

Fusarium dry rots may be problems both in storage and in planted seed tubers. Tuber lesions become visible about a month into storage. Small brown infected areas enlarge and the periderm over the lesion becomes sunken as the affected tissue dries out. Rotted tubers shrivel and mummify. Internally the rotted areas are light to dark shades of brown and contain cavities lined with visible fungus growth. With saturated relative humidity in storage the infected tubers are often further invaded by bacteria that cause a soft rot of the remainder of the tuber and spread to other adjacent tubers.

Fusarium infection occurs in storage through wounds and at cut surfaces of tubers being prepared for planting. Infected seed pieces rot from the cut surface inward. *Fusarium* will entirely or partially destroy the planted seed pieces resulting in missing or small slow-growing plants that produce few marketable tubers.

Infection and development of dry rot in storage is most rapid at high relative humidity and, under those conditions, will continue even at the lowest temperatures for safe storage. Optimum temperatures for dry rot are reported to be 60-68 F. However, conditioning seed tubers from cold storage at that temperature before cutting pieces is suggested to reduce decay and accelerate sprout growth.

Control of dry rot is enhanced by: 1) harvesting tubers from dead vines, 2) avoid wounding and provide aeration during storage, 3) treat seed tubers before storage as well as during preparation for planting, 4) warm seed tubers at 60-68 F for one week before cutting or planting, and 5) plant seed right after cutting in soils warm

enough for sprout growth and wound healing.

Pest Alert - Two stored tuber samples were received in recent months for disease decay. The varieties were Atlantic and Norgold. The Atlantics showed soft rot and the Norgolds had dry stem-end rot. The disease areas were plated on potato dextrose agar and were identified to be *Fusarium*. In 1989, several fungicide seed dusts will be tested specifically for *Fusarium* control. To determine and identify seed decay state-wide, I (editor) request that growers dig out a sample of decaying seed pieces after planting and inform me or Eric Kerr so we can arrange to pick them up for microbial identification.

Getting the Most Out of Farm Strip Trials

Jim Schild

Extension Agent - Agriculture

Scotts Bluff/Morrill Counties

Farm strip trials are an important tool producers can use to evaluate different hybrids, tillage practices, fertilizer treatments, herbicides or insecticides. A few simple steps should be taken to ensure that differences between treatments are "real" and not because of chance or environmental conditions.

- Write down the objective; keep it SIMPLE.
- Keep treatments to a MINIMUM, 3 or 4.
- Select a UNIFORM field location.
- RANDOMIZE treatments within the field.
- REPLICATE treatments at least twice.
- Keep RECORDS of all pre-plant tillage, planting date, seeding rate, variety, soil moisture and temperature, fertilizers, and pesticides.
- Make OBSERVATIONS on rainfall, irrigation, pests, growth differences, nutrient-deficiency symptoms, maturity, and plant population.
- Use above information in INTERPRETING yield data.

- Look for YIELD differences greater than 15%.
- REPEAT the trial next year.

Remember that test results can be an artifact of the way a trial is done or be due to environmental conditions. The 10 steps listed above will minimize outside influence and allow a better test for treatment effects.

Clone Integrity Test

Alex Pavlista, Kent Sather, Arnold Jensen, Linda Jensen, and Gene Shaver

The following is the "clone integrity test" protocols determined at our March 2 meeting.

- Objective - Determine whether clones are true to variety
- Data - Morphology/Appearance
 - Maturity to Senescence
 - Tuber Appearance
 - Chipping Quality

Meristem Maintenance Lab., Mitchell.

Plantlet Increase to 50 (dishes),
 March/April, 1989.

Mini tubers production for 20 (trays),
 May/August, 1989.

Two plantlets for morphology comparison
 (pots).

Field Test (nuclear), April/August, 1990.

Arlin Acres, Hemingford.

Field test (nuclear) of ordered clones, 1989.

Two minitubers used for GH (pots) comparison at Mitchell

Field test protocol:

- Two rows of 10 plants,
 row spacing = 36 in.,
 plant spacing = 12 in.,
 one blank row between clones.
 Plot = 10 ft. x 9 ft. = 90 ft².
- Clones = samples from same tuber
- Clones grouped together under one variety.
- Seed piece - single drops about 1 oz., standard.
- Field standard to be included (single drop, 1 oz.).

Greenhouse protocol:

- Two plantlets (MM) or two minitubers (AA).
- 8 in. round pots.
- Peat moss + vermiculite.

The clones/varieties to be tested are being determined by Arnold and Linda Jensen (Arlin Acres) and by Kent Sather (Potato Certification Association).

