

NEBRASKA POTATO EYES

Technical News Reports for the Nebraska Potato Industry

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Editor's Note:

After a rain-delayed start, all potato plantings are completed. Harvesting the summer crop is about to begin. Compared to last year, there has been an increase in chip acreage in the Panhandle, Southwest and North Central areas in Nebraska. French fry acreage has increased in the North Central and South Central areas. The current estimate of potato acreage in Nebraska is about 14,000, up about 17% from last year.

The soil pest survey, partially funded by the Nebraska Potato Board, is underway. Samples are being taken from potato fields which have had potatoes in the past four years. To date, samples have been taken from the Southwest and South Central areas. In August, samples will be taken in the north and east followed by sampling in the Panhandle and eastern Wyoming. Each sample is a composite of five soil probes and represent 30 acres or so (four per circle). Half of the sample is taken to Lincoln where Dr. Gary Yuen (plant pathologist) will analyze them for Fusarium, Rhizoctonium and Verticillium content this fall. The other half will be analyzed for nematodes. Dr. Eric Kerr (plant pathologist) will do the nematode profile at Scottsbluff.

The potato staff has changed at the Panhandle Research and Extension Center this spring. On April 30, Dan Smith, Agriculture Research Technician, left the University for a position with Kelley Bean Company. He became their fieldman at the receiving station in Holyoke, Colorado. During his year working in potato research, he was a great help and he will be missed. However, we all wish him well in his career endeavors. Kelley Bean Company has a good man.

On June 5, Carl Gall joined the University in the potato project. He replaces Dan. Carl grew up in Morrill, Nebraska where he currently lives. He recently graduated from Chadron State College with a B.A. in Agribusiness; he also carries an Associate degree in Agriculture from West Nebraska Community College. Prior to returning to college, Carl worked at Great Western Sugar and served in the U.S. Marine Corps. Please welcome him aboard.

The annual meeting of the Potato Association of America will be July 21 to 27 in Quebec City, Canada. I will be attending and presenting a research paper. A report will be included in the next Nebraska Potato Eyes issue.



Carl Gall



Dan Smith

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Nebraska Potato Council

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The annual meeting of the Nebraska Potato Council was held May 11, 1990 at Scottsbluff. Speakers included Don Neb from Colorado, Gene Shaver (Nebraska) and Alex Pavlista (University of Nebraska). Key topics and highlights were:

National Potato Promotion Board - Don Neb (CO) - the "No-Refund" potato bill is near passing; expect a referendum this winter. Currently 20% of the funds from the "check-off" is refunded, mostly to the northwest. Imported potatoes will be assessed the same "check-off" as United States production (2¢/cwt).

In 1990, most of the advertising budget will be used for radio spots at rush hour times for working women. The theme is convenience especially microwave cooking. The merchandising program will include concentration on delicatessens.

Chip Seminar - Don Neb (CO) - In 1992, the Chip Seminar will be held in Denver, Colorado. About 300 attendants are expected. The meeting is usually held the first week of March. The hosts are to be the growers of Colorado, Nebraska, and Wyoming.

National Potato Council - Gene Shaver (NE) - The National Potato council met in Las Vegas, Nevada this year. Rollin Packer, Jack Nielsen, and Gene Shaver attended, representing Nebraska growers. Dave Long (WA) was elected the new president.

Most of this year's budget will go to informing and assisting legislators on agrichemicals. The tariff on Canadian potatoes is being phased out; note Canada subsidizes this industry. Advertising dollars are being spent in the "Pacific Rim" to export french fries. Due to the loss of Temik, more research dollars will be directed to Colorado potato beetle studies especially on the eastern seaboard. The first quarter results on the EBDC "market basket" survey is completed. The Task Force reports that "most (residues) were below the measurable limit".

The next annual meeting of the National Potato Council (NPC) will be in January at Hilton Head, North Carolina. The Seed Seminar will also be in January at Miami, Florida and the Red River Valley are the sponsors. The next chip seminar will be in March, 1991 at Nashville, Tennessee and it will be sponsored by the Snack Food Association.

Nebraska Potato Council - Gene Kerschner (NE) - Dale Moore accepted the duties of Nebraska's Chairman of the Chip Seminar Committee. This committee is expected to be organized and begin planning and coordinating with Colorado and Wyoming representatives at the next Nebraska Potato Focus in November, 1990. Please contact Dale Moore at (308) 762-4917 if you could help in any way! Colorado growers (Area III) hold their annual meeting the first or second week of February. About 200 people attend. It was suggested that one or more representatives from Nebraska attend and discuss plans for the chip seminar.

Officers were elected. Gene Kerschner, Dale Moore, and Kent Sather were reelected President, Vice-President, and Secretary. Jeff Swanson was elected Treasurer.

Vine Kill Update

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In April, 1990, Valent USA, Corporation held the 4th Diquat Seminar in Scottsdale, Arizona. State and research reports were presented by research and extension staff from Colorado, Idaho, Maine, Michigan, Minnesota, Nebraska, North Dakota, Oregon, Washington, and Wisconsin. The following are summaries of these reports:

Highlights:

1. Diquat worked best applied in the evening. Des-I-Cate worked best applied in the morning or afternoon.
2. Using oil as an additive to Diquat gave a faster kill than X77, but, over the long run, there was no difference.

3. Rolling or beating plants before Diquat application improves vine kill efficacy.
4. Enquick builds up nitrates in the soil and water table. Acid kill doesn't give much advantage over chemical kill.
5. There are efficacy and environmental complaints about aerial applications.
6. After vine death, waiting 10 to 21 days before harvest improves specific gravity and skin set.

State Reports:

CO (Gary Franc) - Potato acreage distribution in Colorado is 50,000 in the San Luis Valley for fall markets and 8,000 in upper range for summer markets. The top seed diseases are leaf roll and ring rot which are in decline due to tissue culture and seed certification. The top variety is Centennial; Norkotah is increasing in popularity; Burbank is decreasing, and Sangre is unchanged. In the San Luis Valley, the use of sulfuric acid as a vine killer is increasing and Diquat use is unchanged.

ID (*Charlotte Eberlein*) - The 337 thousand acres used for potato production in Idaho were divided into three regions in a vine kill survey. The Southwest accounts for 5% of the total acreage; 12% of these are vine killed. Twenty five percent of the potato production is in the South central and 70% of these acres are vine killed. The major acreage, 70%, is in the Southeast and nearly all of the acres (90%) are killed.

Techniques Used for Vine Kill in Idaho

Region	Diquat —% of potato acreage—	Acid	Flail	Total vine killed 1000 acres
Southeast	10%		2%	2
South central	35%	35%	30%	59
Southeast areas:				212
Aberdeen	5 - 25%	5 - 25%	70%	
Rockford	10 - 30%	40 - 60%	30%	
St. Anthony	50 - 60%	30 - 50%	0%	

The principle area using Diquat vine killing is St. Anthony. Ground application was reported to be satisfactory, but complaints were made on aerial application. Aerial application tended to be nonuniform/spotty, have drift and was sometimes overshot. Diquat was considered, in general, the better vine kill technique.

ME (*Ed Plissey*) - In 1989, 82 thousand acres in Maine were used for potato production. Compared to 1969, this is 1/2 the amount of acres and 1/4 the amount of growers. Chip and seed production has increased while fresh market potatoes has decreased to a third of their 1969 level. Legislation governing production in Maine has increased. In 1986, the "Pesticide Control Board" was established. It governs chemical records, sale and use, and drift control. The 1989 growing season was a late-planting season. There was replanting due to "drown outs". Early cooling in August made vine kill very difficult. Maine growers have petitioned a 3 pt Diquat rate (1 + 1) on all varieties. In 1990, there was no major change in potato acreage. There is a labor shortage; Jamaican labor is being imported. Norkotah acreage increased to 10 thousand. This variety is the first russet not to form hollow heart while having acceptable yields. Coastal Russet has potential. An "air blast" sprayer at 30 gpa improved Diquat performance by propelling the chemical into foliage.

MI (*Rich Leep*) - In Michigan, potatoes are grown on 60 thousand acres and are scattered throughout the state. Seed is precut, chlorine-washed and allowed to suberize for 5 to 7 days. Flattening vines for chemical penetration with a vine roller increased Diquat effectiveness for vine kill. All mechanical kill techniques, roller, shredder, beater, have regrowth problems.

ND/MN (*Duane Preston*) - The Red River Valley is the third largest potato production area in the United States. It produces 25 to 30 million cwt/year. Production is on 170 to 200 thousand acres, almost all of which is dryland. Chip production is the largest segment, 65-70 thousand acres. Red potatoes, primarily Norland and Pontiac, account for 25 to 30 thousand acres. In 1989, only 9 inches of rain fell to raise crops; there was no subsoil

Due to drought conditions, there was poor growth, poor skin set, and poor vine kill by either Diquat, Des-I-Cate, or Enquick. So far up to April, 1990, there were no spring rains.

NE (*Alexander Pavlista*) - Atlantic potatoes were vine killed in strip tests. Application of Diquat (1 pt/a) at 6:00 p.m. was far more effective than application at 8:00 a.m. Multifilm X77 (6.4 oz/a), crop oil concentrate (1 qt/a) and urea (1 gal/a) were compared as additives. Vines killed with Diquat + oil showed more vine death in the first three days than using the other additives. After three days, there were little differences between oil and X77 as additives. At all times, urea was a poor additive to Diquat and is not recommended. A beater effectively shredded vines; however, regrowth was evident after three days, and live vines were lying between the rows. The most effective vine kill treatment was beating vines followed four days later with an evening application of Diquat plus either X77 or crop oil.

Vine Kill Summary, Nebraska, 1989

(Note: All Diquat applications were at 6:00 p.m.)

Days after treatment	Order of Efficacy (best to worst)
1 to 3	Beat > Diquat + Oil > Diquat + X77 > Diquat + Urea
3 to 7	Diquat + X77 > = Diquat + Oil > Beat > Diquat + Urea
Overall Best =	Beat; after three to five days, Apply Diquat + (X77 or oil).

WA (*Gary Pelter*) - The majority of potato production is in eastern Washington under desert conditions. Soils are sandy, sandy loam, and silt loam. Shepody is moving strongly into the processing market. Norkotah is replacing Norgold. HiLite is increasing, and Burbank is decreasing in popularity. Simplot is coming into the state to process red potatoes. An increasing amount of regulation is causing a decrease in aerial application. Aerial application is prohibited within three hours of sunset.

WI (*Larry Binning*) - Potato production in Wisconsin is on 65 thousand acres and the acreage is increasing. The aquifer is 5 to 25 ft below the surface and represents a big problem in potential groundwater contamination.

Yield and Specific Gravity after Diquat and/or Mechanical Vine Kill, Nebraska, 1989, Strip Tests

Diquat	Additive	Best	Yield, cwt/a	SG
0	0	-	380	1.087
+	X77	-	380	1.091
+	Oil	-	370	1.085
0	0	+	330	1.089
+	X77	Pre	370	1.087
+	Oil	Pre	-	1.087

Beat - 8/30, Diquat - 9/3, Harvest - 10/5

WI (Larry Binning) - Potato production in Wisconsin is on 65 thousand acres and the acreage is increasing. The aquifer is 5 to 25 ft below the surface and represents a big problem in potential groundwater contamination. Groundwater is showing increased levels of nitrates and aldicarb (Temik) and is starting to see low levels of herbicides such as metribuzin (Sencor/Lexone). Nitrogen is applied at 200 to 250 lb/a and causing leaching problems. Most Burbanks are grown for processing. The main chip varieties are Atlantic and Superior. Norkotah are grown for fresh market and its popularity is on the rise.

Vine killing tests with Diquat showed that the addition of 2 qts of oil to 1 pt Diquat had a better early kill than with X77 as an additive. Later no differences were observed. Enquick application (twice with 10 gal/a at a total cost of \$40/a) was good but there were concerns over safety and nitrate leaching. This vine kill method adds 20 lb/a nitrogen and the same of sulfur. Two applications are needed. The second application is needed to kill stem tissue.

Research Reports:

CO (Gary Franc) - Sangre, R. Centennial, R. Nugget. Two pint Diquat application was more effective than the 1 + 1 pt split or 1 pt single application. Des-I-Cate was about as effective as 1 + 1 pt Diquat. Thiosul would kill vines but only under dry conditions. No treatment affected stem-end discoloration.

ME (Ed Plissey) - Diquat was most effective when applied in the evening than in the morning. Des-I-Cate was most effective when applied in the afternoon and least when applied in the evening.

% Leaf Desiccation

9/11 9/16

Des-I-Cate, 1 gal + Booster plus E

7:30 a.m.	26	41
3:30 p.m.	31	50
7:30 p.m.	11	19

OR (Steve James) - Russet Burbank; Diquat applied in mid morning with dew present, clear sky, no wind. Leaf kill of 80% was observed after six days; 90% stem kill occurred after 10 days. Waiting 21 days for harvest decreased skinning from 60 to 5%. Shrinking was decreased from 12 to 3% when harvested 27 days after kill. Tests compared 2 pt versus 1 + 1 pt Diquat rate. The single, high dose lowered yields of #1 tubers. The split application was better than the 2 pt single dose.

WA (Bob Thornton) - Russet Burbank planted 4/15.

Harvest Date	DAP	% Dead	% Skinning	Spec. Gravity
9/1	135	15	35	1.078
9/10*	145	45	10	1.083
9/20	155	80	5	1.084
9/30	165	100	2	1.080

*Typical

Desiccation is not currently used in the processing industry. This is changing due to a decline of specific gravity which is related to natural dying. There is also a desire to limit oversize tubers which are not going through the cutting knives.

Vine pulling removes vines at surface and discards them. This technique is used in the Dutch seed industry. A new developing industry is the small skin-on-reds. Norkotah, Century, HiLite, and Frontier are beginning to challenge Burbank processing.

Valent (Ray Henning) - Diquat application at 8:00 p.m. was better than at 9:00 a.m. There was less kill on sandy soils than heavier ones. Skin set was not affected by speed or method of vine kill. Set requires at least 10 days. When potatoes were left in the ground for 10 days after kill, there was less than 15% skinning; when left 20 days, skinning was less than 5%. Fifteen to 20 days were needed after kill to raise specific gravity and to have good skin set. Using sulfuric acid as a vine killer, killed vines faster, but tuber maturation time was the same as using Diquat.

% Leaf Desiccation

9/11 9/16

Diquat, 1 pt + X77

7:30 a.m.	21	30
3:30 p.m.	26	33
7:30 p.m.	29	34

North Central Region Potato Variety Trials

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The North Central Region (NCR) has conducted variety trials for the past 39 years. In 1989, 13 U. S. states and three Canadian provinces cooperated in testing 17 varieties. The cooperating states and provinces were: United States - Idaho, Iowa, Kentucky, Louisiana, Michigan, Minnesota, Missouri, Nebraska, New Jersey, North Dakota, Ohio, South Dakota, Wisconsin
Canada - Alberta, Manitoba, Ontario.

Potatoes were grown under broad climate ranges. Temperatures ranged from hot in Louisiana, North Dakota, and South Dakota to cool in Michigan. Heavy rainfall occurred in New Jersey and Ohio while drought conditions existed in North Dakota, Nebraska, and South Dakota. Soils ranged from sand to loam; most trials were on silt to sandy loam.

The varieties matured the earliest in Kentucky and New Jersey and the latest in Minnesota and North Dakota. The shortest growing season was reported in Iowa (68 days) and Indiana (81 days); the longest season was in Kentucky (167 days) and Wisconsin (152 days). The highest overall yields were in Minnesota and Wisconsin and the lowest were in Ohio and Manitoba. Solids were highest in Nebraska, South Dakota, and Manitoba and lowest in Kentucky. Scab was reported a problem in Indiana, Minnesota, and Wisconsin.

The earliest maturing variety across all locations was Red Norland and the latest was Russet Burbank. The highest yields were obtained from MS700-70, NEA22.75-1, ND1538-1 Russ, and W1005. The highest %s of #1s were NEA22.75-1, MS700-70, and Red Pontiac. Highest solids were recorded for W855 (Snowden) and MS700-70. The best "out of the field" chip colors were observed with W855 (Snowden), MS700-70, Norchip, MN13545, and MN13451.

Nebraska's NCR trial was done at Mitchell on the University station. Varieties were planted on 5/22 and harvested on 9/23 resulting in a 125 day growing season. Averages over all varieties were: yield = 271 cwt/a, yield of 2 inch and greater (#1s) = 246 cwt/a, % of #1s = 90% and % solids = 20.9%.

Overall Merit Rating, 13 years

	<u>1987</u>	<u>1988</u>	<u>1989</u>
	—Total Points—		
MS700-70	18	0	37
W855	0	17	34
NEA22.75-1	0	0	24
W1005	0	0	24
ND2224-5R	0	23	19
ND1538-1 Russ	0	0	17

#1 = 5 points, #5 = 1 point, Total - sum of all

Top Varieties in Nebraska's NCR Trial, 1989

Yields (greater than 300 cwt/a) - Atlantic, MS700-70, MN13420, Red Pontiac, Norgold Russet.

% #1s (2 inch or greater) - Atlantic, MS700-70, Red Pontiac, NEA219.70-3.

% solids (greater than 22%) - Atlantic, Norchip, MS700-70, W855 (Snowden), MN13545.

External Defects (less than 7%) - NEA22.75-1, MN13545, Red Norland, Norgold Russet.

Internal Defects (none) - Norchip, Red Norland, Russet Burbank, MS700-70, W1005, MN13420, ND1196-2R.

Merit Rating - (Atlantic), MS700-70, W855 (Snowden), MN13420 (purple skin), Norgold Russet/Norchip.

The following varieties will be tested in the NCR trial, 1990:

White/chip: Norchip, (Atlantic in Nebraska), MN13540, MN13740, MS41-1, MS402-8, ND2008-2, W856, W870, W877.

Red: Red Pontiac, Red Norland, LA12-59, MN12966, ND1196-2R (repeat).

Russet: Russet Burbank, Norgold Russet, ND1538-1 Russ (repeat).

Nebraska Variety Trials, 1989

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In addition to the North Central Regional Variety Trials. Four variety trials were done in Nebraska. The varieties tested were based on recommendations from Nebraska's growers and depended on seed availability. The trials were two duplicate chip trials, one on Diamond Hill Farms in Alliance and the other at the University's Mitchell Station. Red and russet trials were planted at Mitchell.

The top new varieties in these trials were: Chip - LA01-38 (LaBelle), MS700-70, NE84106, and W855 (Snowden).
Red - LA12-59 and NE8206.
Russet - A7411-2 and A74114-4 (Frontier).

Nebraska White/Chip Trials, 1989
Averages of Mitchell and Alliance Sites

Variety	Yield, cwt/a	% 1s	Specific Gravity	Comments ¹⁾
Atlantic	497	96	1.096	29% S, 14% I
Conestoga	374	96	1.090	
Denali	443	94	1.093	39% S
Gemchip	379	95	1.081	28% S
Monona	378	95	1.075	26% S
Norchip	390	94	1.087	
Wischip	371	93	1.086	
AC80545	390	97	1.087	
LA01-38*	489	96	1.086	18% S
NY81*	378	92	1.080	27% S
W842	336	90	1.098	18% S
W855*	428	95	1.094	38% S
NEA219,70-3	393	96	1.082	
NEA22,75-1	458	96	1.079	
NE8245	420	94	1.080	21% S
NE8286	351	79	1.082	
NE84106	492	94	1.086	14% S
BN9845-1	386	92	1.088	11% S
BN9859-3	386	92	1.083	49% S

*LA01-38 = LaBelle, NY81 = Steuben, W855 = Snowden
¹⁾Mitchell data only; S = scab, I = internal defects

Nebraska Red Trials, 1989

Variety	Yield, cwt/a	% 1s	Specific Gravity	Comments ¹⁾
La Soda	329	95	1.083	
Norland	252	91	1.081	12% P
Sangre	413	97	1.081	12% S, 12% E
Viking	222	95	1.073	16% S, 12% I
Red Cloud	313	98	1.082	20% E
LA12-59	306	96	1.091	12% S, 36% P
NE8206	359	95	1.096	16% S
NDT9	367	98	1.075	36% S
1068-11R				

¹⁾E = external defects, I = internal defects,
P = paling of red color, S = scab (slight, surface).

Nebraska Russet/Fry Trials, 1989

Variety	Yield, cwt/a	% 1s	Specific Gravity	Comments ¹⁾
Burbank	329	88	1.077	43% E, 30% J
HiLite	244	88	1.083	14% I
Krantz	168	95	1.084	39% E
Norgold	420	95	1.084	14% I
Norkotah	367	94	1.083	45% J
A74117-4*	260	88	1.094	
A7411-2	283	89	1.096	21% S
MN10874	237	90	1.084	
NE8476	199	92	1.073	63% E, 23% I
NE84103	267	95	1.073	
Shepody**	321	95	1.090	37% S

* = Frontier, ** = white variety used for fries.

¹⁾E = external defects, I = internal defects, J = jelly ends,
S = scab (slight, surface).

Selection for Nebraska's Variety Trials in 1990

White/Chip:

Standards - Atlantic, Conestoga, Denali, Gemchip, Monona, Norchip, Wischip

Repeats - LaBelle (LA01-38), Snowden (W855), AC80545, MS700-70, W842, BN9845-1, NE84106, NEA22,75-1

New Selections - A80559-2, NY85

Russet/Fry:

Standards - Burbank, Norgold, Norkotah

Repeats - Frontier (A74114-4), A7411-2, Shepody (white)

New Selections - A74212-1

Red/Table:

Standards - LaSoda, Norland, Red Cloud, Sangre

Repeats - LA12-59, NDT9 1068-11R, NE8206, MN13420 (blue skin)

New Selections - ND2224-5R, All Blue (blue flesh)

Chip Potato Seminar

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The 1990 Chipping Potato Seminar was held March 1-3 at the Amway Plaza Hotel in Grand Rapids, Michigan. The meeting was hosted by the Michigan Potato Industry Commission. Two-hundred and thirty-nine people attended the conference and from all regions of the United States.

The main focus of the meeting was on the continued improvement of chipping potatoes. Discussions involved new chipping varieties being developed and evaluated, current status of cold chipping potato varieties, pesticide outlook for the future, specific gravity testing, what is new in storage controllers, and other topics as well. The conference provides an excellent opportunity for growers, marketing people, and processors to get to know one another and talk about mutual concerns.

The following are highlights:

1. SFA Potato Chip Variety Trials, 1989 (Richard Chase, Michigan State University) - The Snack Foods Association has sponsored potato chip variety trials since 1985. Participating states are California, Florida, Maine, Pennsylvania, Michigan, Washington, and the Red River Valley. Trials are done on a miniature commercial basis to simulate commercial handling and production. Data taken in these trials include yield, quality, specific gravity, and chip color. Twenty five varieties are advanced selections after evaluations and comparisons with Atlantic and Norchip. Ten have been named—Niska, Gemchip, Kanona, Allegeny, Steuben, Somerset, LaBelle, Spartan Pearl, Snowden, and Saginaw Gold.

In the 1989 trials, the highest yields were obtained from AC80545-1. Specific gravities of 1.080 and higher were measured from AG875-16, Snowden, Atlantic, MS716-15, D195-24. The best "out of field" chipping occurred with AF875-16, Somerset, AC80545-1, Allegeny, and Saginaw Gold. The lowest average reading was obtained from MS700-70.

Overall yield average of varieties grown in all participating states (1989 results).

Variety	Yield (cwt/a)		% No. 1	Spec. Gravity	AG-TRON
	US#1	Total			
AC80545-1	318	373	85	1.077	59
Allegany(NY72)	280	336	82	1.077	59
Spartan Pearl (MS700-83)	241	301	81	1.072	55
Saginaw Gold	230	295	77	1.076	58
MS700-70	225	278	79	1.079	53
Labelle(LA01-38)	221	262	84	1.076	53
AF875-16	219	257	85	1.086	60
Atlantic	211	266	78	1.085	56
MS716-15	207	222	69	1.080	54
Snowden(W855)	203	259	76	1.083	57
Somerset	199	250	77	1.078	60
NY85(D195-24)	178	230	75	1.082	59
Norchip	163	208	75	1.078	55

Summary of yields and specific gravities of varieties tested in 1986 to 1989 (3 or more years).

Variety	Yield (cwt/a)		% No. 1	Spec. Gravity
	US#1	Total		
Steuben(NY81)	303	331	92	1.083
Gemchip (BR7093-24)	300	332	90	1.079
AC80545-1	277	325	85	1.078
Allegany(NY72)	275	315	87	1.080
Atlantic	264	302	87	1.090
Kanona(NY71)	254	303	84	1.076
MS700-70	250	294	85	1.084
Somerset	224	270	93	1.079
Norchip	213	255	84	1.080

Summary of yields and specific gravity of varieties tested in 1988 and 1989 (2 years).

Variety	Yield (cwt/a)		Percent No 1	Specific Gravity
	US#1	Total		
Labelle(La01-38)	244	279	88	1.077
Spartan Pearl (MS700-83)	241	294	83	1.074
MS716-15	216	255	85	1.083
Saginaw Gold	214	271	79	1.076
Snowden(W855)	205	255	80	1.083

2. Current Status of Cold Chipping Potato Varieties (Robert Johansen, North Dakota State University) - ND860-2 chipped well out of 40° F storage. However, small tubers and poor market yields were obtained. After many crosses and breeding trials to date, the following lines show potential for cold chipping: ND2008-2 (the best), ND1995-1, ND2417-6, and ND2411-8.

3. Specific Gravity of Potatoes (Wilbur Gould, Ohio State University) - Factors influencing specific gravity (SG) can be separated as controllable or uncontrollable. The following outlines these factors:

<u>Uncontrollable Factors</u>	<u>Hinder</u>	<u>Help</u>
Growing Season	too short	
Light/Daylength	too little	
Night Temperature		cool
Air Temperature	above 70°	above 38° F
Wind/Humidity	high evaporation	
Water		at tuber bulking
High Soil Temperature	exposed hills only	

Controllable Factors

Variety - most singly important factor affects SG
 Seed - poor quality and small seed lower SG.
 Minimum size is 1 3/4 oz and 3 oz is preferred.
 Minerals/fertilizers - excess N and K enhance vines and retard tuber maturity, therefore, decreasing yields and SG.
 Soil moisture - keep above 65% field capacity.
 Pests - major area of concern and control.
 Tuber maturity - use shorter vine maturing varieties or vine kill by man-made methods. Sucrose content should be below 0.5% dry matter and glucose below 0.05% dry matter for harvesting and storing tubers for chips.

There are three commonly accepted methods of measuring specific gravity: a) weight in air and in water, b) brine and c) hydrometer. a) Weigh potatoes on a scale. Emerge the potatoes in water and take their weight. SG = (weight in air / (weight in air - weight in water)). b) Set up salt solutions of differing concentrations to make differing densities. Place tubers into solutions and determine whether they float. Tubers will float at their SG. c) A hydrometer may be purchased from SFA. Eight pounds are floated on a basket in water. A scale in a tube on top of basket will give the SG reading.

<u>Uses</u>	<u>SG Range</u>
Potato Salad	less than 1.075
Baking	less than 1.090
French Fries	between 1.075 and 1.100
Flakes/Dehydrated	between 1.080 and 1.100
Potato Chips	between 1.080 and 1.100

Conversion table for specific gravity of potatoes to water, dry matter, and starch in percent.

(Calculated from Von Scheele Equations:
 % starch = 17.564 + 199.07 (Sp Gr - 1.0988);
 % dry matter = 24.182 + 211.04 (Sp Gr - 1.0988);
 % water by difference or 100 - % dry matter)

<u>Specific Gravity</u>	<u>% water</u>	<u>% dry matter</u>	<u>% starch</u>
1.050	86.12	13.88	7.85
1.055	85.06	14.94	8.85
1.060	84.01	15.99	9.84
1.065	82.95	17.05	10.84
1.070	81.90	18.10	11.83
1.075	80.84	19.16	12.83
1.080	79.79	20.21	13.82
1.085	78.73	21.27	14.82
1.090	77.67	22.33	15.81
1.095	76.62	23.38	16.81
1.100	75.56	24.44	17.80
1.105	74.41	25.49	18.80
1.110	73.45	26.55	19.79

Next year the Chip Potato Seminar will be held March 7 to 9 in Nashville, Tennessee and will be sponsored by the Snack Food Association.