

NEBRASKA POTATO EYES

Technical News Reports for the Nebraska Potato Industry

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Editor's Note:

With the close of 1990, the Nebraska Potato Focus was held on December 4 and 5. The topics were fertilization, seed performance, and vine kill. Dr. Robert Thornton affected everyone's view on seed cutting in relation to stand establishment. Everyone learned a lot about chemical and mechanical vine killing and desiccation. The proceedings will be out in May and sent to all who attended. Attendance was 99 up from the 76 last year. Growers from Nebraska, Wyoming, Colorado, South Dakota, and North Dakota were present. All had a good meal at the Scottsbluff Country Club. The next Nebraska Potato Focus is planned for December 10 and 11, 1991 and the main topic will be potato diseases. A number of out-of-state university speakers are planned. Notices will be mailed in the fall.

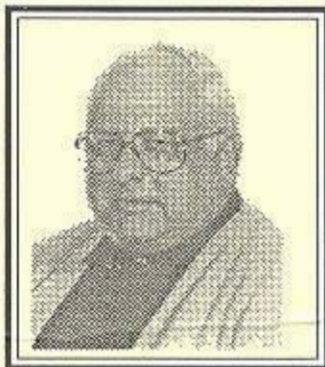
Please, note that two awards were given recently, Bob O'Keefe became an "Honorary Life Member" of the Potato Association of America. Gene Shaver received the "Seed Man of the Year" by the National Potato Council.

As of this issue, there is a new column added to the Nebraska Potato Eyes, "CAFME". The Coalition for Agricultural Financial Management Education will be submitting a column on farm finances to be written by different economic experts from the business and university communities for each issue. After a few issues, comments are needed on their usefulness and, thereby, continuing this column.

Also, pay attention to the notices on Potato Virus Y on Canadian seed and the label change on ASSERT.

Bob O'Keefe Honored by PAA

Oscar S. Malamud
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At the 1990 meeting of the Potato Association of America (PAA) in Quebec City, Canada, Dr. Robert B. O'Keefe of Scottsbluff, NE was honored with their highest award, Honorary Life Membership. Bob joins a very select group which includes from Nebraska, Gene Shaver (1989), Warren Trank (1980) and Dr. Harvey Werner (1954).

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Bob O'Keefe Honored by PAA From Page 1

The following resume was submitted for his nomination:

"Bob O'Keefe was born in Alliance, NE on February 17, 1926. After high school he spent two years in the Navy Air Corps V-5 program. In 1946 he married Darlyne McCormick. They raised eight children and have twelve grandchildren. Darlyne died in 1979. In 1984 Bob married Grace Hesselgesser.

Most of Bob's professional life has been spent in connection with the University of Nebraska. There he earned his B.S. in Botany in 1949, his M.S. in Horticulture in 1959, and his Ph.D in Agronomy (Genetics) in 1965. During that time he was head of the Potato Outstate Testing Program in Horticulture (1950-1952), Supervisor of the Box Butte Experiment Farm (1952-1957) and head of the potato breeding and improvement program. He has been on the Faculty of the University of Nebraska, College of Agriculture since 1950. He was Acting Chairman of the Department of Horticulture in 1971 and 1972 where he initiated an expanded state-wide program in ornamentals, vegetables, and fruits. After retiring in 1989 Bob has been busy consulting.

Potatoes have been first and foremost in all of his endeavors. He was associated with the release of more than seven varieties - several with high tolerance to common scab. As a researcher and extensionist Bob helped improve the Nebraska potato industry and engineered its national importance despite its relatively small size. His accomplishments in connection with tools used in the chipping process are well known to the industry.

As a teacher and advisor he guided undergraduate students in subjects of scientific relevance as well as practical value. For graduate students, many from overseas, he has been a guiding force in the successful completion of their degrees, with programs which focused on their future needs.

Bob has published more than 140 research and extension publications. He was a leading collaborator in research projects for the Potato Regional Programs NC-84 (Genetics), NC-150 (Quality and Nutrition Value), and was a member of the Potato Technology committee of the Potato Chip-Snack Food Association (International).

Bob has served on the executive committee of the Nebraska-Wyoming Potato Council. He was elected to Gamma Sigma Delta Honorary in Agriculture and to Sigma Xi Honorary in Science. Bob has been an invited lecturer on potato breeding and processing at international events in the U.S., Latin America, the Middle East, and the U.S.S.R.

Bob has been an active participant in the Potato Association of America. He was a member of the Certification Section, chairman of the Breeding and Genetic Section, president (1981) and chairman of the annual meeting in Nebraska in 1980. Currently, he is chairman of the North American Variety Handbook Committee.

I am honored and pleased to present Dr. Robert B. O'Keefe for Honorary Life Membership in the Potato Association of America".

Congratulations! Bob.

NPC Honors Gene Shaver



At the 9th Annual National Potato Council Seed Seminar in Florida, Gene was awarded the "Seed Grower of the Year". The award was presented by Fred Flewelling of Maine in recognition of Gene's outstanding career accomplishments. CONGRATULATIONS! Gene.

Seed Seminar

Kent Sather

*Potato Certification Assoc. of Nebraska
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The 9th Annual Seed Seminar held in Miami, Florida in January, 1991 was well attended by growers from the U.S.A. and Canada. Nebraska had a good representation as well. Most growers seemed to come away with a little more information and knowledge generated from the meeting.

The meetings consisted of speakers well known to the potato industry: Duane Preston, Red River Valley Potato Specialist, Dr. Steven Slack, Cornell University; and even Earl Butz, former U.S. Secretary of Agriculture. The main emphasis was that disease ridden potatoes costs you, the grower, money, lots of money. One new concern expressed was the new strain of PVY (potato virus Y) discovered in some Canadian seed potato lots. With that in mind, it is very important to know the history of the seed lot you're purchasing.

A second aspect of the seminar was the tour of the winter test plots run by the certifying agencies of different states. Growers were able to see the growing conditions of the potatoes in that climate. Our Nebraska growers were given guided tours through our plots at their request. They were able to see different problems - variety mix or disease symptoms clearly expressed in the plots.

The seed seminars were originally designed as an opportunity to bridge the gap between commercial growers and seed growers. All are invited to attend annual seed seminars. Sometimes, the best information is exchanged in the hallways at break time or over supper with a grower from anywhere, U.S.A. The next seminar is scheduled for Portland, Maine on December 5-7, 1991. Arrangements will be announced in May.

Potato Virus Y in Canada Seed

Alexander D. Pavlista
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Recently, Agriculture Canada informed the Animal and Plant Health Inspection Service (APHIS) that the necrotic strain of potato virus Y (PVY-N) was detected in several seed lots in the eastern provinces. PVY-N infects potatoes but its presence has never been confirmed in the USA. According to Glen Lee, Deputy Administrator of Plant Protection and Quarantine (PPQ), plant quarantine sections "specifically exclude potatoes from countries where the disease is present". There is little or no damage to potatoes associated with this virus. However, it is devastating to tobacco and PVY-N can be transmitted long distances by infected potato pieces. The vector for transmitting PVY-N from one field to another are aphids. The virus is not in the "true" seed of its hosts.

The infestations were traced from potato and tobacco fields in southern Ontario to their source, infected potato seeds pieces grown on Prince Edward Island. Extensive testing by Agriculture Canada indicated the presence of the virus on 14 farms on Prince Edward Island and three farms in New Brunswick. So far, the virus has been found in four potato varieties - Atlantic, Shepody, Superior, and Russet Burbank. Testing on varieties continues.

Agriculture Canada and the provinces of New Brunswick and Prince Edward Island have agreed to USA wishes until 2/15/91: 1. Not to ship seed lots originating from a farm which had an infected seed lot, 2. Not to ship seed lots originating within 0.6 miles from a field where an infected seed lot was confirmed until all the seed lots tested negative for PVY-N, and 3. Seed lots that are not covered by 1 and 2, may be shipped to the USA only if tested serologically and found to be negative for PVY-N. The plant tissue to be tested are to be either from leaf samples taken from the Florida test plots or from tuber sprouts prepared in a laboratory.

According to Terry Bourgeois, Director, Division of Plant Industry, Maine, the Maine Department of Agriculture has instituted a quarantine on certain categories of potatoes shipped from Prince Edward Island and New Brunswick. The Maine Department of Agriculture felt that the above three conditions for seed lot shipment were inadequate. Therefore, they imposed a quarantine limiting importation from Canada of seed potatoes and bulk shipment of processing and tablestock potatoes. Consumer packs of tablestock are not affected.

Certification/Pathology Sections of PAA

Gary Leever
Potato Certification Assoc. of Nebraska
Alliance, NE

Vancouver, British Columbia and Miami, Florida were the sites for the Winter meetings of the Certification and the Pathology Sections of the Potato Association of America. The Certification Section meeting was held December 4 and 5, 1990 in Vancouver. This meeting's primary emphasis was dealing with old business and nothing new was introduced. However, it was the consensus of the group that the Section should begin in earnest to develop a uniform nomenclature for seed classes.

The winter meeting of the Pathology Section was held in Homestead, Florida just prior to the Annual Seed Seminar in Miami. The first afternoon was spent on a tour of the winter test plots in the Homestead area. The next day, Thursday Jan. 17, was an all-day disease seminar featuring various speakers on fungal diseases. The most important information to all potato growers was data presented by Dr. Gary Secor of NDSU indicating that in North Dakota and Idaho the *Fusarium* fungus may have become immune to the chemical MERTECT. I am sure you will be hearing more on this subject in the near future.

Irish Potato Production in Nebraska

| | 1986 | 1987 | 1988 | 1989 | 1990 |
|--|------|------|------|------|------|
| Harvested acreage .. 9.1 10 9.9 10.2 12 (1,000 acres) | | | | | |
| Acreage yield 264 285 285 306 295 (cwt) | | | | | |
| Total Production 2,399 ... 2,850 2,818 ... 3,126 .. 3,539 (1,000 cwt) | | | | | |

Top Counties in Potato Production

1. Box Butte 1,226,980 cwt
2. Banner 690,160 cwt
3. Chase 479,274 cwt
4. Morrill 136,500 cwt

PAA Meets in Canada

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Extension Potato Specialist

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The Potato Association of America held their annual meeting in July 1990 at Quebec City, Quebec, Canada. The symposium was entitled "Carbohydrate Metabolism in Developing and Stored Potatoes" and was published in the American Potato Journal, September, 1990. The next meeting will be August 11 to 16, 1991 at Spokane, WA. This is a great opportunity to speak with potato specialists, breeders, pathologists, etc. from all over North America.

The "Beetle" and Defoliation:

The Colorado potato beetle (CPB) was first observed in North America in 1920. But, it wasn't until 1959 in Nebraska that damage to potatoes was first reported. Today, CPBs are one of the worst damaging defoliators of potatoes. These insects are resistant to DDT, organo chlorides and phosphates, and carbamates.

How much defoliation can potatoes tolerate? —

Unexpected findings reported by de Oliveira of the University of Quebec at Montreal caused a stir at the meeting. Sebago potatoes, a late maturing variety, were covered with cages containing beetles at densities from 0 to 50 larvae per plant. At exposure, plants were 6 to 8 inch tall at "stage I" (2 to 3 weeks after emergence). Exposure was continuous to harvest. No reduction in tuber production was observed at any CPB level. Plants with an initial exposure of 10 and 20 larvae over-compensated by producing more leaves than controls.

In a companion study, de Oliveira and his colleagues defoliated by cutting leaves, removing 25, 50, and 75% of the leaf surface of Sebago at stage I. In all 3 cases, foliar compensation occurred. At 25 and 50% defoliation, the dry weight of tubers was increased; at 75%, it was decreased.

Irrigation:

Over-irrigation of Atlantic potatoes during the 4 weeks prior to harvest caused a significant decrease in specific gravity. A 3-year study showed that irrigation scheduling produced the highest specific gravity; the mean was 1.088. Slightly higher yields were produced by over-irrigation; this resulted in 16% more hollow heart in tubers over 3.25 inch.

Withholding irrigation from Russet Burbank potatoes until 7 weeks after planting caused early season water stress resulting in reduced plant growth. At the same time, there was a decreased amount of stem-end frying discoloration, less US #2 tubers and a greater percentage of US #1 tubers. In one of 2 years, total yield was reduced.

Fertilization:

Nitrogen — Atlantic potatoes in Michigan (MI) had the highest specific gravity with the addition of 100 lb/a N. Specific gravity decreased as N was added up to 200 lb/a. Yields were not affected.

Russet Norkotah had significant yield increases in MI at closer spacings. The highest % of under 4 oz. tubers was produced at 6 inch spacing and 100 lb/a N. The % of tubers over 10 oz. tended to increase with increased spacing and N fertilization. Specific gravity was higher at lower N and closer spacings. Spartan Pearl (MS 700-83) showed no yield response to plant spacing between 6 and 12 inch. In one of 2 years, there was a significant yield increase between 100 to 200 lb/a N. Tuber size distribution pattern and the effect on specific gravity were similar to that of R. Norkotah. After alfalfa, neither R. Norkotah nor Spartan Pearl showed a yield response to N.

Norland potatoes in Quebec produced optimal yields at 95 days after planting when exposed to 125 lb/a of N. Higher levels of N decreased yield. To obtain maximum yields of earlier harvests required less N. Plant spacings between 7 and 12.5 inch had the same total yields.

The maximum yield of R. Burbank on sandy soil in Michigan was achieved with 120 to 180 lb/a N. The nitrogen was applied as ammonium sulfate. There was a slight advantage to a split application over a starter one.

Calcium — Supplemental calcium in the form of gypsum at 500 to 750 lb/a had no effect on yield, specific gravity, hollow heart, chip color or black spot of Atlantic tubers in Michigan. There was a slight decrease in the amount of internal brown spot (7% compared to 13% for controls).

Minitubers:

Field trials on normally-discarded greenhouse-produced minitubers (1/2 to 3/4 inch) were conducted on minitubers encapsulated in a moist ball of commercial soil mix. The encapsulated, sprouted minitubers yielded 61% more than non-encapsulated minitubers. Closer seed spacing increased yields 36%. Yields of soil encapsulated minitubers were about the same as cut (2-2 1/2 oz) and single drop seed pieces.

Seed Tuber Size:

Different weights of single drop Atlantic and Monona potatoes and 2 oz cut pieces were compared. All single drops gave greater plant growth and tuber number than cut pieces. This growth promotion did not result in significant yield differences.

Varietal Comparison for Processing:

Atlantic, Eramosa, Kanona, Norchip, Onaway, Saginaw Gold, Spartan Pearl, Snowden, MS700-70, and MS716-15 were compared for their processing characteristics. There was no correlation between yield and specific gravity nor between chip color and sucrose. Dark chip coloring was correlated with higher glucose content. Eramosa and Onaway were high in glucose and produced dark chips. The other 8 cultivars produced acceptable chips. Atlantic and MS716-15 had the highest specific gravity (1.085).

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PAA Meets in Canada Continued from Page 4

AC 243,654 is a Yield Enhancer of Superior Potatoes

At the PAA meeting, I presented a paper on plant growth regulator research conducted on potatoes using a new, not commercially available synthetic compound. For those interested, the following is the abstract. A related study will be presented at the 1991 meeting.

"AC 243,654, 1-(m-methoxybenzyl)-3-nitroguanidine, represents a new family of plant growth regulators with cytokinin-like activity. Initial field testing showed a 20% yield enhancement of potatoes. Preliminary greenhouse tests on potatoes cv. Superior resulted in 15% yield increases. The weekly effects of AC 243, 654 on

Superior potatoes treated two weeks after emergence were investigated. Within the first few days, AC 243,654 at 1 kg/ha increased plant height and branch number. Seven days after treatment (7 DAT), plant weight and stolon growth increased. By 14 DAT, tuber initiation was observed in treated plants; controls developed tubers one week later. From 21 DAT until final harvest at 70 DAT, AC 243,654 treated potatoes had a larger yield especially of tubers greater than 1 inch diameter. Tubers smaller than 1 inch were decreased. The percent dry matter of tubers from treated plants was also higher than checks. Similar results on plant development and yield were observed with 4 kg/ha AC 243,654 treatment of Superior potatoes".

SPUDDERS

Gary Leever

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The time has come to talk about the seed potato shipments for the 1990-91 year. Data on exact numbers are presented at the Potato Certification Association's annual meetings. In general the season was brisk at the beginning, slow in the middle (Feb.-early March) and

totally rushed at the end. Seed price was favorable to most grower, however, quality was a little lacking primarily due to Mertect's inability to control dry rot as well as it has in the past. Also many, many seed lots showed a high degree of small internal and surface bruises that greatly affected tuber quality. Considering those two factors very few problems were encountered by Nebraska seed potato buyers and only a very small number of loads had any complaints or requests for reinspection. Therefore, I must assume that our shippers did a very good job of sorting, and our inspection service did a good job also. Unfortunately as we look ahead to next year's crop, we are going to have to look into the past and try to use whatever means available to reduce bruising and promote tuber healing to keep dry rot losses to a minimum.

Potatoes at the CSSA Meetings

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The Crop Science Society of America met with the Agronomy Society of America and the Soil Science of America on October 21-26, 1990 at San Antonio, Texas. This is a large meeting with thousands attending. Topics cover many crops such as corn, wheat, alfalfa, and many aspects from breeding to production management. The next meeting will be in Denver, Colorado from October 27 to November 1, 1991. The following are a couple of highlights from presentations on potatoes:

Clint Shock of Oregon State University tested the yield effect of short-term water stress in Russet Burbank potatoes in a 4-year study. The stress was applied either in late June, July, or early August. Water stress in late June or in July reduced the percent of US #1 yield while increasing that of US #2 yield. These two periods of stress also increased the amount of dark-end french fries after frying. The dark-ends were associated with jelly end rot observed on harvested tubers. The August water-stress gave no effect on yields or dark-ends.

Herman Timm of the University of California-Davis presented a study on potato plant density and the nutrient contents of the plant. The plant populations were 0.8, 1.6, 3.2, and 9.7 sq. ft. soil area per plant. The cultivar studied was Kennebec and the land was flat, without furrows, sandy loam and sprinkler irrigated. Fifty percent of the roots formed in the top 6 inches of the soil and 90% was in the top 12 inches. As the surface area per plant increased, there were reduction in calcium, magnesium, and phosphorous in the plants. Potassium, nitrogen, and sodium content was not affected. Herman reported that the highest total dry weight yield was obtained at the surface areas of 0.8 and 1.6 sq. ft./plant.

Field Sandbur

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Sandbur (burgrass) is a problem weed on sandy or coarse textured soil. The North Platte Valley, southwest Nebraska, and the Sandhills are geographic areas in the state where sandbur is a major problem in irrigated fields. Sandbur also grows on the fine textured soils of eastern Nebraska, but seldom becomes a primary weed problem on such soils. Both field (*Cenchrus pauciflorus* Benth.) and longspine (*Cenchrus longispinus* Benth.) sandbur grow in Nebraska.

Description:

Sandbur is an annual plant which completes its life cycle through seed production in one year. Stems are 6 inches to 3 feet long, branched, flattened, and usually prostrate, forming a mat on the ground. Leaf blades are smooth, flat or rolling, and attached to a sheath with hairy margins. The roots are fibrous and relatively shallow. Seed spikes bear clusters of 10 to 30 burs. Spiny burs are 1/4 to 1/2 inch in diameter, with 1 to 3 seeds per bur. Each straw colored bur has many sturdy, backward hooked spines which cause discomfort to man and animals.

Sandbur seeds germinate throughout the summer months. Those that germinate in late July and early August still produce plants which have burs in the fall. It is difficult to totally eliminate sandbur seed production using herbicides and cultivation. Control of the early season flush of sandbur seedlings, however, should allow production of top yields.

Control:

The first flush of sandbur seedlings develop in May. Disking the soil twice with a time period between diskings can destroy germinating sandbur seed. Cultivation should usually supplement herbicides for effective sandbur control. Since sandbur is shallow rooted, cultivation can be very effective in removing escaped plants between rows.

Sandbur is best controlled by using a combination of good cultural practices, cultivation, and herbicides. Clean tillage implements and the combine after each field to avoid starting new infestations. Sandbur often spreads over the entire field from the border if good sanitation is not practiced. Some growers have found that, by using a more effective sandbur herbicide on the field borders, they

can apply a less expensive herbicide treatment on the rest of the field.

Sandbur is a difficult weed to control. Many of the herbicides widely used do not specifically list sandbur as a controlled weed. Sandbur control will be in the 60 to 85 percent range with preemergence applications of Dual or Prowl. The relative ineffectiveness of commonly used preemergence herbicides on sandbur may contribute to the increase of this weed. Prowl's effectiveness preemergence is improved when incorporated into the top 1 to 2 inches of soil within 7 days after application. Incorporation is not required if rain or irrigation occurs within the above 7 day period. Treflan can be used and should be incorporated. It may, however, retard emergence and cause stem brittleness.

Prowl may be used for extended sandbur control in potatoes. It is registered for early postemergence on potatoes if the plants are not under any stress. Only one application of Prowl is permitted per season.

Newly registered is Poast which will control postemergence grasses. Potatoes at all growth stages are tolerant to this herbicide. Poast is not to be incorporated. Cultivation should not be done between 5 days prior to application to 7 days afterward. Note, oil is to be added to Poast as an adjuvant.

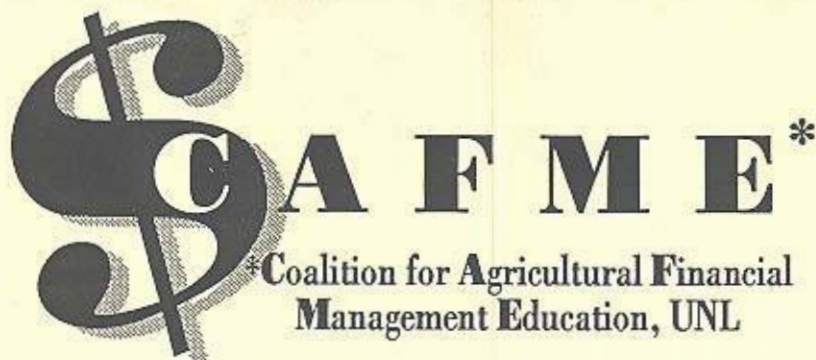
Potatoes After ASSERT

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The ASSERT label has recently been changed with respect to potato rotation after wheat or barley. American Cyanamid Company has announced an increase in the rotation interval for potatoes to 15 months on acres treated with ASSERT herbicide. There is a potential for crop injury with a shorter interval due to variability of environmental conditions which affect the herbicide's degradation. In other words, for example, land treated with ASSERT in 1990 should not be rotated to potatoes until 1992.

Pesticide Update

1. Market basket survey on EBDC was completed recently and all the data looks good.
2. Cut seed pieces have been pulled from the **Mertect** label as a seed treatment. It still can be used on single drops.
3. **Aldicarb**, (Temik) will not be available for potatoes next year.



Farm and Ranch Records: How Long Should They Be Retained?

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No one will argue with the importance of keeping and maintaining adequate records in a modern farming operation. However, some speculation exists regarding the length of time one should retain various documents. As a general rule, most records dealing with the current year's operating income and ex-

pense need be retained for only seven years. Records of capital purchases, contracts, or insurance policies should be kept up to seven years after sale or cancellation. Some records, such as tax returns, general account ledger minute books should be retained indefinitely.

Following is a list of recommended retention periods for various types of records:

| | |
|---|---------|
| Account Book or General Ledger | P ① |
| Accounts Payable Files | 7 years |
| Accounts Receivable Ledger | 7 years |
| Bank Statement, Canceled Checks & Deposit Slips | 7 years |
| Capital Purchases Vouchers (Years after sale or other disposition) | 7 years |
| Contracts (Years after final payment or disposition) | 7 years |
| Corporate Minute Books | P ① |
| Deeds, Titles, Abstracts | P ① |
| Duplicate Checks or Deposits Slips | 3 years |
| Financial Statements (Balance Sheet, Income Statement, Statement of Cash Flow) | P ① |
| Insurance Policy (after expiration) | 3 years |
| Operating Expense Receipts | 7 years |
| Payroll Records | 7 years |
| Personnel Records | P ① |
| Sales Receipts (business operation) | 7 years |
| Scale Tickets | 7 years |
| Tax Returns & Reports | P ① |
| Warehouse Storage Receipt (after expiration) | 7 years |

① = Permanent Retention

This list is intended to be used as a guideline. There may be reasons for an individual business to retain some records for an extended period of time. Examples would be: proving yields for ASCS, a pending lawsuit or bankruptcy, or development of historic data for trend analysis of operation.

Cleaning and rotating files should be performed at

least annually and will aid in effective record keeping and filing of current information. Separate file drawers or dividers should be established for permanent records, previous year(s) records, and current information. Proper organization and record retention will make record keeping a more relaxing and worthwhile task.

*Coalition for Agricultural Financial Management Education, UNL