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Testing soybeans especially important this year

Quality of farm-saved seed varies widely

The quality of soybean seed tested at the Nebraska Crop Improvement Laboratory this year is quite variable and, on the average, lower than in the previous three years. Average germination for all soybean seedlots tested in recent years is 89% in 1994 and 1995, 96% in 1996, and 85% in 1997. Soybean producers planning to use farm-saved seed should carefully consider the quality of their seed and the potential effect on yield.

The variability this testing season has dramatically shown the need for accurate seed sampling techniques and testing. The seed in any bin is so variable that sampling from just one or two spots will not help determine the quality of the overall seed for planting purposes. For information on proper sampling techniques contact the laboratory where you plan to have the seed tested.

Soybean seed quality

Soybean seed matured rapidly last fall. Some of the early maturing soybean varieties, which were harvested early, have germinated well throughout the testing season; however, many other seed lots had moisture levels decline to 8% or 9% prior to harvest.

(Collapsed on page 4)

Crop Watch returns with new target topics

Crop Watch is returning with its slate of old favorites — timely pest reports, pesticide updates, and management recommendations — as well as some new items. Several issues will target wheat, corn, soybean and sorghum production. In addition, stories related to two special topics — site specific management and impacts of biotechnology — will be included throughout the year.

The main thrust of the newsletter will continue to be to provide timely pest management and crop production information when you need it most. This may be especially important this year as uncertain climate trends and a mild winter open the door for possible pest and production problems.

For those readers who like to get their information from the Web, the expanded Crop Watch News Service is back and this year offers an index, photo gallery, and limited search capability (which we hope to expand) as well as all the features from last year. While the actual site is password protected for subscribers, a sample site is available at

(Collapsed on page 2)
NebGuide update

For those of you who regularly subscribe to or catalogue your Extension NebGuides, please note the following update for Sclerotinia Stem Rot of Soybeans, G95-1270.

It does not list a chemical for the treatment of sclerotinia in soybeans, however one is available. In the last paragraph of the last page, you may want to note that thiophanate-methyl (e.g. Topsin M) fungicide is labeled for Sclerotinia on soybean.

The increasing crop pressure from this disease will be one of the topics addressed during the special soybean issue.

Jim Steadman, Professor Plant Pathology

Crop Watch
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http://www.ianr.unl.edu/cropwatchnews

To subscribe to either version of the newsletter, please use the form on page 10 or one available at the Web site.

I welcome you to contact me throughout the year if you have any suggestions or comments for the newsletter or if you would like to submit a question to a specialist to be answered in the newsletter. (Please be sure to let me know if you want it to be published anonymously.)

We appreciated the comments you made in the 1997 readership survey and will be incorporating your suggestions. Information on how to convey information to Crop Watch is always available in the box on the second page of the newsletter.

Lisa Jasa
Crop Watch Editor

Natural virus tested for corn earworms

A natural insect pathogen called a baculovirus may provide a solution for farmers losing their corn crop to the earworm.

An entomologist with the Agricultural Research Service's Insect Biocontrol Laboratory in Beltsville, MD, is genetically altering the baculovirus to overwhelm the earworm with an overdose of an appetite-stopping hormone. The hormone, which is naturally found in the earworm, creates havoc for the earworm but is harmless to humans, livestock and plants.

Southern corn growers are estimated to lose $1.5 billion annually in crop losses and chemical controls. Sweet corn growers may spray up to 20 times a season to ensure corn unblemished by the earworms.

Agricultural Research
Published by the U.S. Department of Agriculture
Poor quality, farm-saved seed may lead to increased soybean diseases

Producers planning to use farm-saved soybean seed this year should consider possible secondary problems beyond initial germination (see page 1).

This year’s lower quality seed may be more susceptible to seed and seedling diseases. Also, the possible contamination of seed with damaging pathogens could further increase the risk of poor stands and low yields.

Two pathogens in particular are of concern to soybean production in Nebraska: Sclerotinia stem rot and soybean cyst nematode. Soybean Mosaic Virus (SMV) was not widespread in 1997 so the presumed risk for farm-saved seed-borne transmission of this virus would be low for 1998.

**Seed and Seedling Diseases**

Several pathogens can cause seed and seedling diseases, including *Pythium, Phytophthora, Alternaria, Fusarium, and Rhizoctonia*. There were several reports of significant stand losses to *Rhizoctonia solani* on soybeans grown in northeastern and north central Nebraska in 1997.

High quality seed should be planted in these areas.

**Sclerotinia Stem Rot**

Sclerotinia stem rot of soybean has been observed in northeastern Nebraska since the early 1990s. In 1997, this disease was reported on soybeans from eastern Nebraska to Ogallala. In some locations yield loss was experienced. Sclerotia, the primary survival structure of *Sclerotinia sclerotiorum*, are produced either on the surface of infected plants or imbedded within the stem. These sclerotia are approximately the same size as soybean seed and are harvested along with the crop. Soybean seed from affected fields can be contaminated with the sclerotia of this pathogen. Sclerotia can survive for as long as seven years in the soil. *Sclerotinia* has a broad host range (over 400 plant species). Consequently, once introduced to a field, *Sclerotinia* can be very difficult to manage. Contaminated seed is believed to be the most important mechanism of introducing *Sclerotinia* to a field.

**Soybean Cyst Nematode**

Soybean Cyst Nematode (SCN) was first reported in Nebraska in 1991. To date, it has been confined mostly to the counties adjacent to the Missouri River. Soybean cyst nematode can cause serious yield losses and once introduced to a field can be almost impossible to eradicate. The cysts of this nematode can survive in soil for up to 11 years and are easily spread by farm equipment. The nematode cysts also can be mixed in with seed. To minimize the risk of introducing this pathogen into your fields, do not plant seed from fields infested with soybean cyst nematodes.

More detailed descriptions of these diseases and management recommendations will be presented in future issues of *Crop Watch*.

Jim Stack
Extension Plant Pathologist
South Central Research and Extension Center

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"Protected" varieties not accepted for conditioning

If you're a soybean producer taking farm-saved seed in to be conditioned remember that any seed with the Roundup Ready or any other patented transgenic technology can not be accepted. You will need to complete a form, stipulating the variety source of the seed.

These forms help protect the conditioner, who could be held liable along with the producer, if the seed was from a patented source. If a variety is patented or contains a patented gene, a producer may not save any seed for planting and a conditioner may not clean any saved seed.

Along with the disclaimer form, which should be completed and filed for at least three years, seed conditioners should save a small sampled (one-half cup) of the unprocessed seed. The seed should be placed in an envelope and the envelope should be sealed with the signature of the seed producer across the seal.

Like last year, commercial seed companies are expected to be monitoring this situation carefully to protect their investment. Roger Hammons
Secretary-Manager, Nebraska Crop Improvement Association

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Reader update

Briefs, updates and field reports will again be featured on the second page of each newsletter, as they become available during the season. A question and answer column also will be included.
Testing soybean seed  (Continued from page 1)

producers decided to leave these in the field, waiting for the rains and rehydration of the seed to occur naturally. Soybean seed is ideally harvested at 12-13% moisture to minimize mechanical damage. The natural rehydration from the rains and snows last fall caused a rapid increase in seed moisture and many fields were then harvested for seed. This higher seed moisture did decrease mechanical damage, but the rapid changes in seed moisture also caused severe internal cellular damage.

The seed conditioning process cannot identify and remove the soybeans which have been damaged internally. These seeds tend to be weak germinators. Typically a soybean with internal damage will sprout and exhibit a short root, then the stem will slowly emerge to about 1/2 inch to 3/4 inch and growth will stop. Unfortunately, if the seed is not tested by a reputable laboratory familiar with the classification and interpretation of abnormal seedlings, this can be interpreted as a good seed.

This season in the laboratory we have had seed lots with up to 60% abnormal seedlings incapable of sustaining growth in field conditions. Very few of the seeds in the germination tests are dead, but the abnormal counts are extremely high. The variation is extreme in any given seed bin because the seed moistures in the field and even on a single plant were so variable last fall. With rehydration causing internal cell crushing, especially in the driest seeds, the variability increased. The rehydration process alone causes internal damage, but when coupled with rapid temperature changes as was the case last fall, damage is worsened.

What should you do?

The first choice should be to buy soybean seed from a reputable dealer because they have taken measures to ensure that their seed is good and will perform adequately. If you have to use your own soybeans for planting, have them tested. Subdivide the amount you need for planting and have subsamples of these portions tested by a reputable seed laboratory. High quality seed lots will exhibit very slight variations between the tests, but in about half of the seed lots tested this year, the variability has been wide, usually ranging from 12% to 15% although some were even greater. These lots should be used for planting only under ideal field conditions.

Larry Prentice, Lab Services Manager, Nebraska Crop Improvement Association

Select hybrids to avoid virus

Remember to select corn hybrids that are resistant to the High Plains virus, warns Stan Jensen, a USDA plant pathologist at the University of Nebraska, in a recent press release. The High Plains virus can kill every plant in a field of susceptible corn, especially if the field is infected when plants are less than one foot tall. Wind-borne wheat leaf curl mites carry the virus from field to the field and between corn and wheat. As wheat matures, the mites move out to find succulent green plants. Susceptible varieties of

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Soybean seedling evaluation

On the left, normal high vigor soybean seedlings that would be counted as good in a laboratory test. On the right, abnormal soybean seedlings with poor root development, which would be counted as bad in a laboratory test.

(Reproduced with permission from the Association of Official Seed Analysts' Seedling Evaluation Handbook, 1992, pages 39 and 43.)
March 6, 1998

How will El Nino affect crops this year? Uncertain Nebraska lies between the extremes

With the 1998 growing season rapidly approaching, there have been numerous inquiries concerning the impact of El Nino on crop yields. The 1997-98 El Nino is the second strongest of the 23 recorded similar events in this century — only the 1982-83 El Nino was stronger.

El Nino is a dramatic warming of the eastern Pacific Ocean which leads to increased evaporation and available moisture for precipitation. It typically will peak around Christmas and rapidly dissipate in spring. It can significantly alter the jet stream pattern across the northern hemisphere and normal winter weather patterns.

The opposite phase of El Nino is La Nina, a significant cooling of the eastern Pacific Ocean. Below normal temperatures across this region decrease evaporation. Drier than normal conditions typically invade the southern United States in winter, while the northern third of the United States experiences colder than normal conditions.

Because of the strength of this El Nino, the southern jet stream has been more energetic than normal. The northern jet stream which dominates winter weather across North America has been displaced 500-1000 miles north of its normal track.

Dramatic climatic events have been witnessed across North America since last fall. The southern one-third of the United States and the entire east coast have received above normal precipitation. Severe mud slides in California, flooding along the Gulf Coast, powerful tornadoes in Florida, and severe significant ice storms in the Northeast have all been linked to El Nino.

The northern third of the United States has been warmer than normal since late November. In addition, much of the Northern Plains, Great Lakes, and the upper Mississippi River Valley has been drier than normal the last four months.

And in Nebraska . . .

Nebraska has been a boundary between the extreme conditions experienced across the northern and southern United States. Southern Nebraska has experienced above normal precipitation since last October, while northern Nebraska has been drier than normal with some areas more than 75% below normal precipitation.

Temperatures have been above normal since early December — 2-4 F in southern Nebraska and 4-6 F in northern Nebraska. January and February have had the most pronounced warming, with extreme northeastern Nebraska averaging almost 8 F above normal during the last two months.

How long these trends continue will depend on El Nino. Some models indicate an end by early summer, while others suggest that this El Nino may linger into the early fall.

Using historical information, it’s possible to examine what effects El Nino and its counterpart, La Nina, have had on Nebraska weather previously. Excluding this year’s event, there have been 22 El Nino’s and 18 La Nina’s since 1900. On average, one of these two events will occur every two years.

An analysis of Nebraska climate relationships was undertaken to examine whether certain trends could be isolated during those years when there was an active El Nino or La Nina event.

Three time periods were examined, October-December of the year when the event was building, January-April of the next year when the event was dissipating, and May-September.

The state was separated into three climate zones. The southern zone consisting of the southern two tiers of counties, the northern zone consisting of the northern two tiers of counties, and the central zone consisting of the remaining counties.

El Nino

Temperatures across the northern zone were above the long-term mean during 60% of the observed events. In the central zone temperatures were equally distributed, while southern zone temperatures were below the long-term mean 60% of the time. This pattern remained consistent in each of the three seasons.

Precipitation trends were more variable than temperatures. During the October-December period, precipitation was above the long-term mean 60% of the time across the southern zone and 53% of the time across the central zone. Precipitation across the northern zone was below the long-term mean 55% of the time. During the

(Continued on page 6)
New diagnostician joins plant pathology

The winds of change have blown in the direction of Extension plant pathology. David Wysong retired Dec. 31 and our new plant disease diagnostician, Loren Giesler, started Feb. 13.

Loren replaces Diane Merrill as the new Extension Technologist/Plant and Pest Diagnostic Clinic coordinator. A native of Arkansas, Loren received a B.A. in biology from Chadron State University and an M.S. in plant pathology from UNL. He will complete his Ph.D. in Plant Pathology this May. We’re thrilled to have Loren on board in such a key position for Extension plant pathology.

Dave Wysong’s crop responsibilities will be assumed by Dr. Jim Stack, Extension Plant Pathologist at the South Central Research and Extension Center, and myself until Dave’s position is filled. Since Jim’s expertise is in row crops (corn, sorghum and soybean), he will assume the leadership role for these crops. I will continue to empha-size small grains, alfalfa, turf and ornamentals, but will also address row crop problems that are sent to Lincoln. Loren’s primary responsibility will be the Plant Disease Clinic. He also will address fruits, vegetables and home garden disease problems.

Eric Kerr, extension plant pathologist at the Panhandle Research and Extension Center, is retiring March 31. Eric’s expertise in sugar beet and dry edible bean diseases will be missed. Dr. Jim Steadman in the Department of Plant Pathology will help with any dry edible bean disease problems that develop this growing season. Eric indicated we could still call on him for help with sugarbeet diseases.

Dave and Eric have been my mentors in extension plant pathology for almost 23 years. I will miss them both.

John E. Watkins
Extension Plant Pathologist

El Nino — potential ramifications (Continued from page 5)

January-April period, precipitation was above the long term mean 60% of the time in each of the zones.

Precipitation tendencies during the May-September period are not favorable across the northern two-thirds of the state. The northern zone received below mean precipitation 70% of the time, with this tendency occurring across the central zone 60% of the time. There were equal chances of receiving below or above mean precipitation across the southern zone.

When the northern and central zones were dry during the growing season, 30% of the time precipitation was less than 80% of the seasonal mean. This is significant because significant yield reduction in dryland crops has been observed when precipitation during the growing season is less than 80% of normal.

La Nina

Precipitation trends were drier than normal across the entire state through the spring months. During the October-December period, precipitation was below the long term mean 60% of the time in each zone. In the January-April period, 80% of the events were below the long term mean across the northern zone, 65% across the central zone, and 55% across the southern zone.

During the May-September period, precipitation was above the long term mean 60% of the time. However, the central zone was drier than the long term mean 55% of the time, while the northern zone was drier 70% of the time.

Temperatures were above the long-term mean during the October-December period 70% of the time across the southern zone and 60% of the time across the central zone. There were equal chances of receiving below or above mean precipitation across the northern zone. Temperatures were below the long-term mean during the January-April period across the entire state. During the May-September growing season, temperatures across the northern zone were below the long-term mean 60% of the time and the 55% of the time across the central zone. The southern zone exhibited no temperature tendency.

What’s next?

When looking at the years when no El Nino or La Nina was present, no dominant trends were observed for the southern and central zones during any of the three time periods. The northern zone is an exception. During the growing season, temperatures and precipitation were above the long term mean 60% of the time. El Nino and La Nina both favor drier weather during the growing season.

The climatic trends discussed in this story are to help producers and consultants recognize the degree of risk involved in various climatic events; however, trends are not predictions. There is no way to accurately predict if this crop production season will follow historical trends for El Nino.

Al Dutcher, State Climatologist
Agricultural Meteorology and Climatology
Alfalfa

Leafhopper-resistant varieties: are they worth it?

Alfalfa varieties that resist injury from potato leafhoppers are being advertised widely in farm publications. Last summer many alfalfa fields turned yellow and stopped growing because of potato leafhoppers. Now alfalfa varieties that resist potato leafhoppers are being sold. Should you use them?

The level of resistance to leafhoppers in the best varieties is only 25% to 30%. This is only a moderate level of resistance, so yields still decline when leafhoppers attack unless timely spraying is done. Still, research in several states shows that leafhopper resistant varieties may produce as much as fifty percent more yield from cuttings where leafhopper injury occurs.

When leafhoppers are not a problem, though, resistant alfalfas yield about five percent less than the best varieties. So there is a yield cost to having leafhopper resistance. Another cost is the price of the seed. It averages one to one and one-half dollars per pound more than the other top seeds.

Producers should buy these varieties only if they frequently have problems with potato leafhoppers. This pest usually causes enough damage east of Nebraska to make the resistant lines worthwhile; leafhoppers rarely are a big problem west of Highway 81 in Nebraska. In between these regions it's a gamble. Varieties with more resistance are expected in a couple years and definitely will be worthwhile. Until then, leafhopper-resistant alfalfa should be limited in Nebraska.

Bruce Anderson
Extension Forage Specialist, UNL

Timing of weed control is essential to assuring a clean, weed-free first cutting of alfalfa.

Weeds like pennycress, downy brome, mustards, cheatgrass, and shepherd’s purse are common in the first alfalfa cutting. They lower yields, reduce quality, lessen palatability, and slow hay drydown. If you walk over your fields today you probably can see their small, green, growth.

Often a weed problem isn’t recognized until the alfalfa greens up and it’s too late for most herbicides. Scout alfalfa fields now and plan control programs accordingly.

If alfalfa has been established one year or longer, Lexone, Sencor, Velpar, and Sinbar can be used. These herbicides control both winter annual grasses and broadleaf weeds including pennycress and downy brome. Alfalfa injury may occur on soils containing less than 1% organic matter. If dormancy has broken, Sencor can be impregnated on dry fertilizer and applied before there is 3 inches of new alfalfa growth. Foliage should be dry.

Pursuit can be used on seedling alfalfa after the second trifoliolate stage at a rate of 3 to 6 ounces. After the alfalfa has been established for one year or longer, Pursuit may be applied at any time. All Pursuit applications should be made 30 days before harvest.

Kerb and Karmex also are labeled for use on established alfalfa. Kerb controls downy brome and other grasses; Karmex controls mostly broadleaf weeds. Karmex has performed well in western Nebraska, but the heavier soils in eastern Nebraska usually result in reduced weed control.

(Continued on page 10)
Check stored grain temperature; aeration may be necessary

With spring weather coming, producers need to check the temperature and condition of grain stored in their bins. There are reports from several local elevators that the temperature of some grain being delivered last month is near 60 F. This indicates that the grain was not cooled properly before winter storage.

Whether holding wet grain for a short time or storing dry grain for longer periods, it is important to control grain temperature. The grain mass needs to be monitored throughout the year:
- cooled in the fall;
- held at 30 to 35 F through the winter;
- warmed in the spring;
- and held at about 60 F through the summer.

Keeping the temperature below 60 F as long as possible will help minimize insect activity and increase the chances of getting through the summer without fumigating the grain.

Aeration fans should have been run periodically during the storage period to keep the grain at a seasonally cool temperature, within 10 F of the average monthly ambient air temperature. Maintaining this temperature should minimize moisture migration during storage. Air convection currents — warm air rising and cool air falling — cause moisture migration problems in bins of improperly cooled grain (see figure). During winter, the warm air in the grain rises in the center of the bin. When the moisture-laden air contacts cold grain near the top center of the bin, condensation occurs.

Problems caused by this moisture movement often become obvious in the spring when outside air temperatures begin to warm.

The first indication of trouble is usually damp or tacky feeling kernels at the grain surface, followed by the formation of a crust. Moisture also moves by vapor diffusion from warmer to cooler areas in the bin. If grain is not properly cooled for winter storage, there is a tendency for moisture to move to the cool grain along the bin sidewall, causing spoilage. Producers should check both areas for potential problems. If discovered in time, the crust can be broken up and the aeration fan turned on to dry the grain in the area of moisture accumulation.

A cooling or warming zone can be moved through the grain using aeration fans. The rate of movement depends on both the airflow rate (cfm/bu) and the hours of fan operation. For example, with an airflow of 0.1 cfm/bu it takes about a week to completely move a cooling or warming front through the grain mass, whereas with an airflow of 0.75 cfm/bu, it takes about a day. When the fan is running, the producer should check the exhaust air for any "off-odors" which may indicate mold growth or spoilage.

Producers should also use a grain probe to check the grain mass for non-uniform temperatures, high moisture pockets or layers, molds, and insects. Problems should be corrected as soon as possible to prevent deterioration and possible serious economic loss. Consult NebGuides G94-1199, Management to Maintain Stored Grain Quality, and G84-692, Aeration of Stored Grain, for more information on grain storage, temperature management, and aeration.

Paul Jasa
Extension Engineer, UNL
Army cutworms reported in Scottsbluff

The mild weather during late February resulted in a few calls in Scottsbluff about army cutworms present on sidewalks as they traveled ‘en masse’ from grassy areas, presumably looking for food. Also, army cutworm activity has been seen in western Kansas and eastern Colorado. It is probably too early to see substantial feeding damage from army cutworms, but these reports indicate that growers need to be diligent in monitoring their alfalfa and winter wheat fields as they begin to break dormancy. Any delayed green-up of alfalfa or poor regrowth of winter wheat should be investigated immediately.

Information on the life cycle and management of army cutworms is available in the NebGuide Management of the Army Cutworm and Pale Western Cutworm (G114S). The army cutworm spends the winter as a partially grown larva and usually is a threat to wheat and alfalfa shortly after these crops break dormancy. Later in the year row crops such as sugar beets can be threatened by the cutworms as they look for additional food. These cutworms will remain a threat until the larvae mature in May.

Alfalfa and wheat fields should be monitored early in the spring. Larvae will be found near the crown of alfalfa plants or buried in the soil or under clods in wheat fields. They feed mainly at night, but may be found on plants on some cloudy days. Treatment decisions should be based on the numbers of cutworms present, the amount of damage, and the plant’s ability to outgrow damage. In poorly growing wheat two or more army cutworms per square foot would warrant treatment; in healthy wheat, four or more per square foot would be the threshold. In established alfalfa four or more per square foot would be required. It is important to consider the ability of the plants to outgrow defoliation damage as well as the numbers of cutworms present.

If treatment is needed, cutworms are best controlled with the use of pyrethroid insecticides. Pyrethroid insecticides are labeled both in wheat and alfalfa for use in controlling the army cutworm. Always follow all label directions and precautions.

Gary Hein
Extension Entomologist
Panhandle Research and Extension Center

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**Alfalfa weed control**  (Continued from page 7)

Butyric or Butoxone (2,4-DB) is "so-so" on pennycress and other mustards in the spring but can be used in both established alfalfa and new seedings where plants have at least two trifoliate leaves. Do not use these herbicides if temperatures may drop to 40 F within three days after application.

Buctril can be used for broadleaf weed control in new seedings of alfalfa after plants have at least four trifoliate leaves. It should be used when the temperature is below 70 F. Buctril provides only fair control of pennycress and mustards that have overwintered.

Treflan TR-10 is registered for the control of annual grasses including downy brome and cheat in established alfalfa. Because Treflan does not control established weeds, it needs to be applied in late summer to control downy brome. Spring treatments will not control established downy brome. To be successful, herbicides need to be applied soon — before alfalfa shoots green-up. If herbicide application is delayed until alfalfa shoots are green, alfalfa growth may be set back two to three weeks.

Bruce Anderson, Extension Forage Specialist, UNL
Alex Martin, Extension Weeds Specialist, UNL

**High Plains virus**  (Continued from page 4)

neighboring young corn plants are an attractive food source.

The best tool to control the vector mites and manage High Plains virus is to keep fields clear of all green matter for at least 10 days before planting. Chemical or mechanical means can be used to control green weeds and volunteer wheat.

Wheat varieties resistant to the disease have not been identified, so it’s especially important to use all other means to control its spread, Jensen said. Wheat producers should destroy grasses that can sustain concentrations of mites until wheat seedlings emerge. (There will be more information on the High Plains virus in a future Crop Watch.)

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