Cooperative Extension
Colorado State University, Fort Collins, Colorado 80523

Colorado State University

AGRON-  -GRAM

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EAR STUNTING OF CORN IN WESTERN COLORADO

A physiological condition of corn was observed in western Colorado during 1989 in which the ear was shortened and the tip section failed to produce kernels. We refer to this condition as corn-ear stunting. It appeared to be more severe in the Grand Valley than other areas of western Colorado, but was also observed in the Uncompahgre Valley. Grain yield loss attributed to corn-ear stunting in one Grand Valley field was estimated to be greater than 75%. Owners of one farming operation indicated that ear stunting reduced corn grain yields 33% below normal. Long-time farmers in the Grand Valley have indicated that corn-ear stunting has occurred in many years, but not as severe as experienced in 1989. Farmers have indicated that when ear stunting occurs, the problem is often more severe in fields with more productive soils.

They have also indicated that some corn hybrids appear to be more susceptible to ear stunting than others. Corn planted during the last of April through the first week of May exhibited more ear stunting than later-planted corn. Corn planted during this period appeared to be more sensitive when adverse climatic conditions occurred and caused irreversible ear damage. This condition occurs often in eastern Colorado.

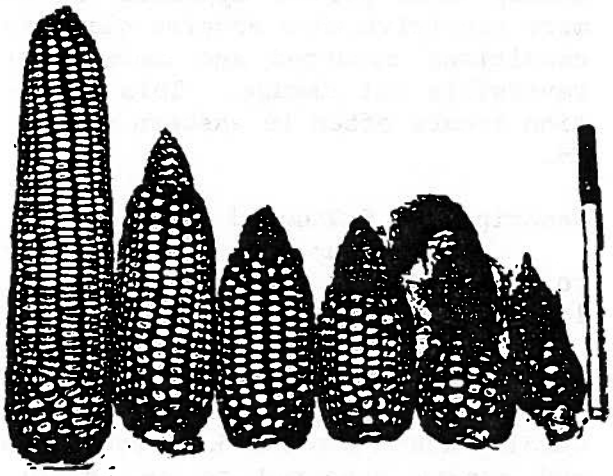
Description of Stunted Ears

Stunted ears have two readily apparent visual symptoms. The ear length is much shorter than a normal ear, and the tip section of the ear does not produce kernels. The section of the ear tip appears to have unpollinated florets. Husk formation and growth appeared to be normal. Corn plants exhibiting ear stunting otherwise appeared to be healthy, although under extreme conditions, plants were chlorotic with some leaves having bright red midribs. The lack of ear tip fill could be from poor silk emergence, the lack of viable pollen at the time silks on the upper section of the ear emerged or some other factor.

Recommendations to Prevent Corn-Ear Stunting

Little is known about the specific factors that cause ear stunting in western Colorado. Some crop management practices may help minimize corn-ear stunting. It is thought that corn-ear stunting may be reduced by planting after the first week of May. Corn hybrids appear different in their susceptibility to ear stunting. Hybrids selected for plant-

ing should be based on a local production history. Stresses that can be managed by the farmer should also be minimized. These include applying optimum amounts of fertilizer based on soil-test recommendations, minimizing competition by controlling weeds, and irrigating to avoid stress, particularly during periods of high temperatures when evaporative demand is extreme. Research is needed to determine factors that affect corn-ear stunting.



Normal ear at the left compared to ears exhibiting increased severity of corn-ear stunting. Pearson & Golus

SEED CERTIFICATION 1990

The spring cropping season is rapidly approaching and with it comes new farmers interested in producing certified seed. Many farmers have never produced certified seed and others may have produced seed using different rules or different crops. Many times these farmers call the county extension office for information. Be sure that you have the latest information for them.

Foundation or Registered seed must be planted on clean ground. Clean ground means that the field must have been planted to a crop different than the crop the preceding planting season.

The first application form the potential grower must fill out is the "Application for Field Inspection" (Form A). This form was redone a year ago, so your file copies may not be up-to-date. Newest forms are green in color and allow the grower to apply for up to ten fields on one form. Forms are due back in the CSGA office by May 15 for fall sown cereals or June 1 for spring sown cereals.

All seed fields must be inspected and seed must be conditioned through a CSGA Approved Conditioning Plant. All seed must be tested for germination and purity, and tagged according to seed certification rules. The seed is not certified until all of these steps have been taken and the Colorado Seed Growers Association issues a Certification certificate.

After the grower submits his application for field inspection, the certification office will send a confirmation of the application along with other information that will help him to be familiar with the steps of seed certification.

Producing Certified seed is a way for the farmer to receive increased revenue from his crops, but he must comply with all Certification Standards. The Colorado Seed Growers Association will assist growers and extension agents accomplish this goal. Please call us at (303) 491-6202 for any further details.
Stanelle

SOYBEANS LEAVE NITROGEN FOR CORN

Soybeans can provide significant amounts of nitrogen to first-year corn on certain Wisconsin soils, according to University of Wisconsin Madison Soil Scientists Larry Bundy and Todd Andraski.

Studies have shown that corn

benefits from nitrogen fixed by other legumes or from other rotation effects not directly associated with nitrogen. Because soybean acreage in Wisconsin has doubled since 1970, growers are increasingly interested in the effects of soybeans in rotation.

The researchers evaluated continuous corn, first-year corn following soybeans and second-year corn following soybeans in rotation. They found that first-year corn following soybeans on silt loam soils reached optimum yields with 40 pounds less added nitrogen fertilizer per acre than continuous corn. At the optimum nitrogen rate, first-year corn yields increased by nine bushels per acre on the well-drained silt loam and 31 bushels.

Second-year corn following soybeans achieved a slight yield increase on the poorly drained silt loam. Follett

AVAILABLE vs. TOTAL LEVELS OF ELEMENTS IN SOIL

Environmental concerns have prompted many people to have their soils tested for heavy metals. There are basically two ways to test for metals. One method is to analyze the soil for available or extractable forms of elements and the other is to do a total soil digest.

At the Soil Testing Laboratory, available elements are extracted from soil using ammonium-bicarbonate-DTPA (AB-DTPA). The extract is then analyzed by inductively coupled plasma (ICP) to determine levels of micronutrients and other metals such as zinc, iron, manganese, copper, lead, cadmium, nickel, molybdenum, boron, chromium, strontium, barium, aluminum and titanium. These are elements that could be available for plant uptake. They would include those elements in the soil solution and those easily released from soil colloids. A soil test to determine available forms of elements would be useful to determine if potentially harmful levels of metals exist in the soil that could accumulate in plants.

Minerals and some organic constituents can contain heavy metals that are not readily available for plants and are not extracted with AB-DTPA, therefore the soil has to be digested with a combination of nitric, perchloric or hydrofluoric acids to break down the mineral and organic fractions. The metals are then released into solution and can be easily analyzed by ICP.

The concentration of elements from a total soil digest are higher than those from an extract. The concentration of iron, for example, can be 20,000-30,000 ppm from a total soil digest, but only may be 20-30 ppm from an AB-DTPA extract.

Total soil digests are useful where industrial contamination may be suspected and the dust could be ingested or inhaled. Municipalities also monitor the application of sludges by determining total levels of elements in their samples so that they do not overload the soil with heavy metals.

The type of analysis is really determined by what kind of information is needed. Available or extractable levels of elements would be useful to those growing plants or concerned about leaching. If industrial wastes are suspected to be in the area, then a total digest may be more appropriate. Self

FERTILIZING HAIL DAMAGED CORN

Foliar fertilizing hail damaged crops is a common practice in Colorado hoping that improved fertility will stimulate recovery of damaged plants. This is practiced more on corn and dry beans but I've heard of fertilizer applied to other crops after hail. Has research proven this

practice to be effective?

Most irrigated acres in Colorado are highly fertilized for yields somewhat above the long term field average yield and have adequate nutrient reserves. When adequate soil reserves of major nutrients exist, then additional nutrients applied to the foliage or through the center pivot, have not increased yields. If the crop is deficient, then yields will be improved because a shortage existed and not from improved recovery after hail damage.

Kansas State University conducted a three-year study testing the value of supplemental nutrients after hail on corn. In this study, plots were artificially hailed to 70% defoliation at the 12-14 leaf stage and the tassel stage and compared with similar non-hailed treatments as shown in Table 1. Robert L. Croissant

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Table 1. Effects of simulated fertigation on yields of irrigated corn hail damaged at Garden City, KS. 1981-1983.

	Hail			Non Hail		
Fertigation	1981	1982	1983	1981	1982	1983
	bu/a*					
28-0-0	79.0	63.0		179.5	135.0	
Sulfur	91.0	69.0		193.5	124.0	
12-0-0-26S	72.5	51.0		164.0	108.5	
10-34-0	99.0		51.5	188.5		74.5
Folian	96.0	59.0		200.0		
Check	99.0	59.0		202.5	113.0	
Urea			50.0			68.5
Water only			55.5			60.0
No water			50.0			66.0
LSD (.05)	7	8	8			

*Average of 2 hail dates with 70% defoliation (14 leaf and tassel)
A soil test taken prior to additional nitrogen application is advised.

Reference: Hooker, M.L., et.al. 1984. J. Fert. Iss. 1:130-135.

Sincerely,

Bob

Robert L. Croissant
Extension Specialist and Assoc. Prof.