

Weeds Consume Soil Moisture

A publication by the University of Nebraska showed how much water it takes to produce one pound of dry matter for weeds and crops (see table below). Note how weeds are as good or better scavengers of water than most of our common crops.

Water Used for Plant Growth

(pounds of water required to produce one pound of dry matter)

Crop	lbs. Water*	Weed	lbs. Water*
Alfalfa	844	Lambsquarters	660
Corn	349	Mustards	2400
Sorghum**	305	Pigweed	298
Soybeans	646	Common Sunflowers	744
Wheat **	545		

*Lists pounds of water used to produce each pound of dry matter. **Grassy weeds are believed to be similar to sorghum or wheat. Source: Univ. of Nebraska; Crop Protection Clinic Proceedings; "Weeds are Using My Water and Stealing My Fuel," Bob Klein, 2005

In a field of 6 inch corn with a population of 30,000, there are about .75 plants per square foot. In a moderate foxtail infestation, there can easily be 100 plants per square foot. One hundred 3 inch tall foxtail plants can easily overwhelm a single 6 inch tall corn plant trying to compete for the same soil moisture.

Bob Kacvinsky, Syngenta agronomy service representative in Nebraska, worked with Midwest Research, Inc. to document the impact of early-season weeds on crop moisture. The research, conducted in 2006, demonstrated what happens to a 1.7 inch rainfall (1.2 inch initial rainfall followed by a one-half inch irrigation five days later) in weedy corn versus corn where weeds were controlled by a pre-emergence herbicide (moisture sensors were installed at a 6 inch depth).

- **In weedy corn**, 40 percent of the initial 1.2 inch rainfall didn't even reach the moisture sensor. A one-half inch irrigation five days later had little impact on water availability and seven days after it fell, the weeds had completely removed the soil moisture. This shows that the thick carpet of weeds at rainfall prohibited a significant amount of moisture from reaching the roots, and the moisture that did reach the soil was quickly depleted by the competition between weeds and corn.

- **In corn where weeds were controlled by a pre-emergence application of Lexar**, more than 60 percent of the moisture was still available to the crop seven days after the rainfall. The weed-free corn was able to effectively utilize the moisture, while 40 percent of the moisture did not even reach the roots in the weedy corn trial.

In 2007, this trial was replicated at the same York, Nebraska, location. Even though this location had a wetter year than the previous year, the percentage of available soil moisture was still greater with the full-rate Lexar application compared to post-emergence only treatments.

This reinforces the "3:3:1" rule. Three inch weeds in three days can remove up to one inch of water.

The estimated cost of an irrigated inch of water ranges from \$5 to \$11 per acre. If 3 inch grasses can remove one inch of water every three days, then you are potentially losing 2 inches of water each week. Replacing water can cost \$10 to \$22 per acre – a cost which could alone cover a complete, pre-emergence foundation treatment.

Feed Your Corn, Not the Weeds

Protect your resources...

Lumax EZ and Lexar EZ, which are powered by the Callisto® chemistry, owe their origin to the discovery of a natural herbicide secreted by the *Callistemon* plant. This is Callisto Plant Technology and it brings unprecedented broadleaf weed control and exceptional crop safety to Lumax EZ and Lexar EZ that the competition cannot match.



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For more information, visit CallistoPlantTechnology.com or FarmAssist.com.

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GS 402.30102 (12/12)

SLC 1933D 12-2012

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Weed Management

Helps Growers Overcome Yield-Limiting Factors in Corn

Each year, growers invest thousands of dollars to harvest the most abundant crop possible. Nutrients, water and other resources all improve yield potential, but their effects are minimized when weeds are allowed to compete with the crop. **Research shows not controlling weeds at the earliest time possible can decrease yield by robbing the crop of these valuable resources, making early-season weed control critical.** Growers rely on effective pre-emergence residual herbicides like Lumax® EZ and Lexar® EZ herbicides from Syngenta to control weeds early and provide ultimate yield protection in corn.

Have you ever stopped to think about just how many weeds are lying in wait in your field? The photo below shows 153 velvetleaf plants in only one square yard. Multiplying that by the number of square yards in one acre equals 740,520 velvetleaf plants per acre – **40 times the biomass of the corn population!**



Studies reinforce research that proves weeds consume valuable resources like nitrogen and water, which can negatively affect corn development. Using effective, broad-spectrum herbicides like Lumax EZ or Lexar EZ controls broadleaf weeds and grasses, which leaves more nutrients for the corn and allows for increased yield potential.

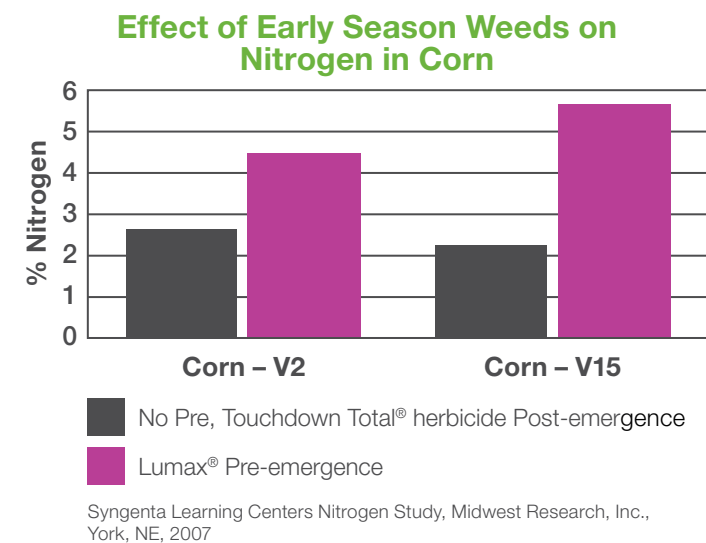
Not controlling weeds early could lead to detrimental weed populations in your field. In this photo, more than 150 velvetleaf were found in one square yard of a corn field.

Source: Syngenta Learning Centers™, York, NE, 2006

Weeds Consume Nutrients Faster Than Our Crops

Many of our common weeds consume nitrogen, phosphorus and water faster than corn. When a glyphosate-only treatment leaves 40 times more weed biomass than corn in the field, just imagine how many valuable resources are being consumed by those weeds.

In 2006, research results found that 1-2 inch weeds contained more than 9 pounds of nitrogen per acre. **At \$0.50/lb. that's \$4.50/A worth of nitrogen feeding weeds and not your corn.**



Studies conducted in 2007 demonstrated that at the V2 stage of corn growth, corn in weedy fields had accumulated approximately half the amount of nitrogen that corn in Lumax-treated fields contained. Most surprising, however, were the results at the V15 stage, which demonstrated an early nitrogen deficit, even after weeds were removed, lasted all season – impacting crop health and yield potential.



Touchdown Total, Post-emergence



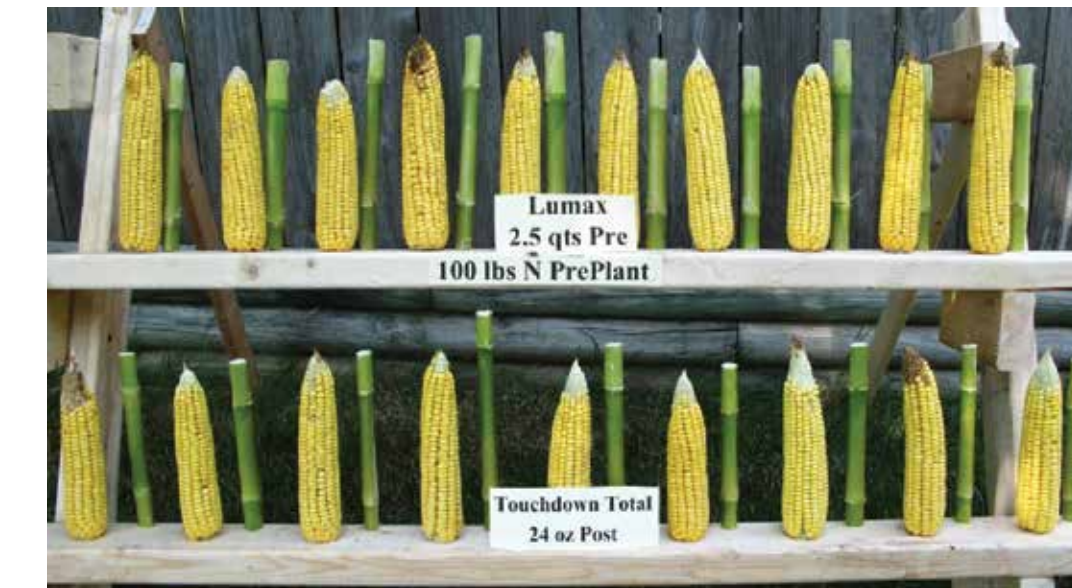
Lumax, Pre-emergence

Weeds Negatively Impact Corn Development

Weed competition for soil moisture and nitrogen can result in reduced grain fill. Aborted pollination and ear tip back are common results of early stress from weed competition. The photos below show the visible differences in stalk quality

and ear development in corn treated with a pre-emergence herbicide (Lumax) versus a post-only treatment (straight glyphosate) when the same amount of nitrogen was applied.

Lumax Pre vs Touchdown Total Post



Yield:
179 bushels/A

Yield:
164 bushels/A

Syngenta Learning Centers, Nitrogen Study, York, NE, 2007



As the number of growers choosing glyphosate-tolerant corn hybrids increases, it is important to remember glyphosate alone does not protect yield because it can

allow for early-season weed competition. The highest yielding, best agronomic herbicide program for glyphosate-tolerant corn is a pre-emergence application of Lumax EZ or Lexar EZ herbicides followed by Halex® GT herbicide.

A pre-emergence application of Lumax EZ or Lexar EZ will significantly reduce weed populations throughout the growing season because of the residual control provided by these products. If a post-emergence application of Halex GT is necessary, Lumax EZ or Lexar EZ widens the window for the application, allowing growers greater timing flexibility.

Herbicides powered by Callisto Plant Technology®, including Lumax EZ and Lexar EZ, provide unprecedented broadleaf weed and grass control that protects yield potential in both glyphosate-tolerant and conventional corn during the critical early stages of development. Protecting your plants early ensures they receive the most water, nutrients and fertilizer available so you know your investments are feeding your corn, not the weeds.



Final Total Post-emergence Yield: **164.7 bushels/A**



Final Lexar Pre-emergence Yield: **182.6 bushels/A**

Yields averaged across 2006-2007. Syngenta Learning Centers.