

In Cooperation, Colorado Corn Growers, Irrigation Research Foundation and Orthman Mfg Present:

Reported as of December 23, 2008

A 2008 Limited Irrigation with Two Application Rates, Varied Population with Eight Seed Corn Company Entries in a Strip-Till Environment with Precision Placed Fertility Study Results

2008 Limited Water, Varied Population, Root Development & Nitrogen Corn Study

Irrigation Research Foundation -- Yuma, CO Circle A

Planting Population: 20K, 25K & 30K/acre

Planting Date: 5/1/08

Strip-Till: 20.5 lbs. N, 35.8 lbs. P 40% @ 4" & 60% @ 10"

Harvest Date: 11/17/08

Starter: 30 lbs. N, 40 lbs. P, 3 lbs. K, 6 lbs. S, 2 lbs. Zn Applied 5/1

Plot Size: 4 rows/variety

Through Sprinkler: 35 lbs. N applied the following dates: 6/23 7/7 7/16 7/24

Yields Adjusted to 15.5% Moisture

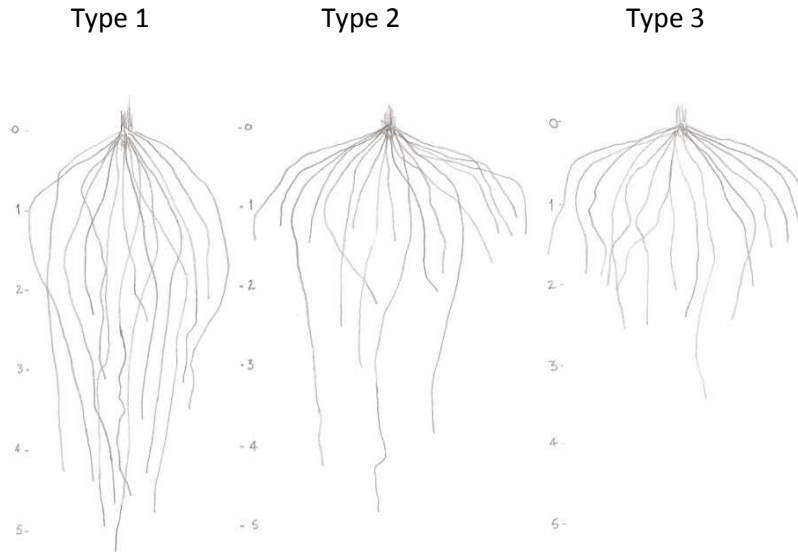
Rainfall during growing season: 17.84" (5.5" rain within 24 hr period June 4th & 5th)

	<i>30,000 pop.</i>	<i>25,000 pop.</i>	<i>25,000 pop.</i>	<i>20,000 pop.</i>
Variety / Days to Maturity	9.5" applied	9.5" applied	5.75" applied	5.75" applied

201 lbs. average Nitrogen used applying 9.5" irrigation

176 lbs. average Nitrogen used applying 5.75" irrigation YIELD is in BU/acre

	1strep	2ndrep	1strep	2ndrep	1strep	2ndrep	1strep	2ndrep
Average Yield of Root Type 1	180.6	168.9	146.6	157.7	154.3	168.5	140.2	168.4
Average Yield of Root Type 2	149.2	175.4	151.2	167.1	176.2	156.9	149.9	141.1
Average Yield of Root Type 3	161.6	169.1	155.7	157.7	154.9	159.0	130.2	142.3



This field based study was part of the research the Colorado Corn Growers started at the Irrigation Research Foundation in 2008 to assist growers make more valuable decisions in view of the diminishing Ogallala Aquifer in a portion of the High Plains states of Kansas, Colorado, and Nebraska. With deep irrigation wells being limited in total amounts of water that may be pumped during a growing season by irrigation districts rulings in the states, farmers are struggling to find the correct hybrids to produce sound economic yields. Water is being limited to much less than full evapotranspiration crop needs. With those limitations, yields may be compromised and significantly lowered yields without better than average rainfall.

Observations of this Study:

In 2008 the rainfall came after a dry month of July and more than 15 days of clouds and cooler than normal temperatures limiting heat units and solar radiation. Colorado Corn Growers decided upon the strip-till system and precision placement of fertilizers prior to planting to minimize compaction restrictions to root development. Yields were adversely affected by the cool August and wet with limited sunlight.

What we did see in the population variances and two water regimes; when watered with 9.5 inches the 30,000 population the root Type 1 corn varieties yielded 12bu/ac better than the Type 2 and 9bu/ac better than the Type 3. In the 25,000 plant population, same water amount of 9.5 inches applied; in 2008 Type 1 was 7bu/ac less than the Type 2 and Type 1 was 4bu/ac less than Type 3 rooting systems. As the IRF staff lowered the application rate of water during the growing season to 5.25 inches the results were mixed in the 25,000 population; Type 1 was 161bu/ac, 4 bu/ac better than Type 3 and 5bu/ac less than Type 2. At the lowest population treatment the Type 1 varieties yielded 154bu/ac, 9bu/ac better than Type 2 and 18bu/ac better than the Type 3 rooted varieties. At the highest population the corn varieties the deeper rooted corn varieties, this years' climatic environment yielded significantly better than the more shallow rooted corn varieties when irrigated to the 9.5 inches level. Totaling up the rainfall (17.8"), applied water via irrigation (9.5") and stored soil moisture as of May 2008 (6.5") the corn crop the 2008 crop totaled 24.8 inches in the highest watering regime. Estimated evapotranspiration in the Yuma area is 27.1 inches per season. In the lower water regime, we can total up the rainfall (17.8"), applied water via irrigation (5.75") and stored soil moisture as of May 2008 (6.5") the corn crop the 2008 crop totaled 20.0 inches.

In another look the 2008 limited water study corn yields when we look at the effectiveness of added irrigation water and what becomes of the yield. Refer to table below. This offers a different look at the 105-112 day corn varieties as ranked in root type and how they yield grain to added inches of water during a cool and wet year.

Variety / Days to Maturity	<i>30,000 pop.</i> 9.5" applied	<i>25,000 pop.</i> 9.5" applied	<i>25,000 pop.</i> 5.75" applied	<i>20,000 pop.</i> 5.75" applied
Comparison of Average Yields per Root Type at Varying Populations Yield by added Irrig.Water				
	Avg of Each Rep	Avg of Each Rep	Avg of Each Rep	Avg of Each Rep
Average Yield of Root Type 1	18.3bu/in applied	16.0bu/in applied	28.0bu/in applied	26.8bu/in applied
Average Yield of Root Type 2	17.1bu/in applied	16.7bu/in applied	28.8bu/in applied	25.2bu/in applied
Average Yield of Root Type 3	17.3bu/in applied	16.4bu/in applied	27.39bu/in applied	23.6bu/in applied

We ask you to come back after the harvest of the 2009 crop and make comparisons as to how limiting water makes a difference yield with the three root types the trial is using in the Western Corn Belt study.