

# Strip-Till Benefits Corn Yields

**December 2008 Reported Yields - Strip-Till vs. Conventional Tillage – Irrigation Research Foundation ---**

**Location: Field B near Yuma, Colorado**

*Study Coordinators: Jeff Tichota – Monsanto Co., Irrigation Research Foundation and Mike Petersen- Orthman Manufacturing*

2008 was the fourth year of this deficit irrigation study. Two DEKALB hybrids, DKC 55-24 (105 day relative maturity) and DKC 60-18 (110 day relative maturity) were planted at 32,000 plants per acre on the full irrigation portion; the seeding rate was reduced to 25,000 plants per acre under limited irrigation. Plots were eight rows by 300 feet long and duplicated. Fertility was applied via Strip-Till under both Strip-Till and conventional tillage. The conventional tilled area was disked prior to seeding. This procedure insured that fertility was similarly placed under Strip-till and conventional tillage. Additional nitrogen was equally applied through the pivot on Strip-Till and conventional till. A series of three hail storms on June 4, 2008 injured the corn causing stand loss. Population counts at harvest are shown in the table below.

<b>DKC 55-24 Full Water</b>	<b>Conventional Till</b>	<b>24,500 plants/acre</b>
<b>DKC 55-24 Full Water</b>	<b>Strip-Till</b>	<b>25,000 plants/acre</b>
<b>DKC 55-24 Limited Water</b>	<b>Conventional Till</b>	<b>20,500 plants/acre</b>
<b>DKC 55-24 Limited Water</b>	<b>Strip-Till</b>	<b>21,500 plants/acre</b>
<b>DKC 60-18 Full Water</b>	<b>Conventional Till</b>	<b>28,000 plants/acre</b>
<b>DKC 60-18 Full Water</b>	<b>Strip-Till</b>	<b>27,000 plants/acre</b>
<b>DKC 60-18 Limited Water</b>	<b>Conventional Till</b>	<b>19.250 plants/acre</b>
<b>DKC 60-18 Limited Water</b>	<b>Strip-Till</b>	<b>23,500 plants/acre</b>

### *Climatic Conditions:*

Rainfall was more abundant in 2008 reducing irrigation; the full watered portion of the field received 7.5 inches while the limited water area received 6.0 inches of irrigation. Rainfall by month is documented below.

<b>May</b>	<b>June</b>	<b>July</b>	<b>August</b>	<b>September</b>
1.87 inches	4.46 inches	1.94 inches	7.29 inches	0.87 inches

Trial results are compromised by stand loss which limited corn yields under full water. The limited water area has reasonable plant stands for deficit irrigation but summer rainfall eliminated drought stress in August and September. A number of high wind events caused plants to lodge and ear loss reduced overall yields.

### *Study Results:*

Corn yields usually show a yield advantage for Strip-Till compared to conventional tillage. The Strip-till yield advantage trends are evident in both the full watered and limited water portions of the field. Plant stands tend to be higher in the Strip-Till strips; residue from the prior year corn crop may have helped to protect plants during the hail storms. Increased plant stands were needed to utilize fertility and available moisture from irrigation and rainfall. As follows:

## **Monsanto Limited Water Corn**

*Irrigation Research Foundation -- Yuma, CO -- Circle B*

Strip-Till: 20.5 - 35.8 - 0 applied 3/27--10 g.lacre @ 4.' & 15 g.lacre @ 10" Conventional: Disc 4/4

Planting Date: 5/6/08 Harvest Date: 11/19/08

Starter: 30-40-3-6-.2 applied 5/6/08 at 19 g.lacre

Through Sprinkler: 32-0-0 6/21 6/29 7/05 7/10 each date applied 10 gal./acre

Herbicide Program comprised of Degree Xtra, applied on 5/13/08 @ 2.9qts/acre, then RoundUp weather Max @ 32oz/ac with AMS on 5/13 and 6/28/08 to clean weed issues. Boom sprayer was used for application.

Population rates are what we set the planter to seed at 32K, 28K, 25K etc.

## Monsanto Limited Irrigation Results 2008

### .....Tillage Comparison Plots with 32,000 Plant Population.....

7.5 inches Applied Water	Moisture/Test Wt.	Yield Adj to 15.%	Tillage Type
105 day DKC 55-24	15.1%/58#	139.2bu/ac 32K pop.	Conventional
105 day DKC 55-24	13.6%/58#	177.6bu/ac 32K pop.	Strip-Till
110 day DKC 60-18	14.6%/58#	178.1bu/ac 32K pop	Conventional
110 day DKC 60-18	14.4%/58#	184.6bu/ac. 32K pop	Strip-Till
105 day DKC 55-24	14.1%/58#	166.5bu/ac. 32K pop.	Conventional
105 day DKC 55-24	14.1%/59#	170.3bu/ac. 32K pop.	Strip-Till
110 day DKC 60-18	15.8%/57#	176.1bu/ac. 32K pop.	Conventional
110 day DKC 60-18	15.4%/57#	201.9bu/ac. 32K pop.	Strip-Till

### .....Varied Population rates under the Strip-Till program.....

7.5 inches Applied Water	Moisture/Test Wt.	Yield Adj to 15.%	Tillage Type
102 day DKC 52-59	14.4%/57#	122.8bu/ac. 23K pop.	Strip-Till
105 day DKC 55-24	14.3%/56#	110.8bu/ac. 23K pop.	Strip-Till
102 day DKC 52-59	14.3%/57#	89.6bu/ac. 28K pop.	Strip-Till
105 day DKC 55-24	14.3%/58#	147.5bu/ac. 28K pop.	Strip-Till
102 day DKC 52-59	14.5%/57#	159.4bu/ac. 33K pop.	Strip-Till
105 day DKC 55-24	14.3%/58#	112.9bu/ac. 33K pop.	Strip-Till

### .....Tillage Comparison Plots with 25,000 Plant Population & Less Irrigation Water.....

6.0 inches Applied Water	Moisture/Test Wt.	Yield Adj to 15.%	Tillage Type
105 day DKC 55-24	14.7%/58#	147.9bu/ac. 25K pop.	Conventional
105 day DKC 55-24	14.9%/58#	143.1bu/ac. 25K pop.	Strip-Till
110 day DKC 60-18	15.6%/58#	153.0bu/ac. 25K pop.	Conventional
110 day DKC 60-18	14.5%/58#	145.2bu/ac. 25K pop.	Strip-Till
105 day DKC 55-24	14.3%/59#	129.6bu/ac. 25K pop.	Conventional
105 day DKC 55-24	14.3%/60#	142.9bu/ac. 25K pop.	Strip-Till
110 day DKC 60-18	15.8%/58#	111.8bu/ac. 25K pop.	Conventional
110 day DKC 60-18	15.7%/57#	194.9bu/ac. 25K pop.	Strip-Till

Tillage Type definitions for this area: Conventional – Two disk operations and One field finisher operation prior to planting. Strip-Till – One pass prior to planting with Strip-Till implement with application of fertility as mentioned at start of this table.