

# Silage Corn Variety Trial in Central Arizona

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## **Abstract**

*Information on silage corn yield and quality can help silage growers and users choose varieties that best fit their needs and area. We conducted a silage corn variety trial using seven varieties for use in Central Arizona. Variety 28Z47 produced the higher silage yield with an average of 30.4 ton/acre and the variety 28V71 had the highest crude protein content (8.13%) among the eight. Varieties that produced higher yield, higher crude protein, and lower NDF than the average of the eight varieties were 851VT3 and TMF-2L-872.*

## **Introduction**

Variety selection is one of the most important decisions producers make for their operation. Due to the number of varieties available in the market, Central Arizona growers have expressed interest in silage corn variety trials. The University of Arizona provides an unbiased view of varieties being released into the market. The area under silage corn has gone down the past years from 35,000 acres in 2008, 30,000 acres in 2009 and 23,000 acres grown in 2010 (USDA, 2010).

Both yield and quality are important in silage corn production. In addition to crude protein, Acid Detergent Fiber (ADF) and Neutral Detergent Fiber (NDF) are two important indicators of silage quality. ADF refers to cell wall portions in the silage that are made up of cellulose and lignin and NDF refers to the total cell wall (ADF+hemicellulose). Low values of ADF and NDF are desirable because ADF and NDF are inversely related to digestibility of silage and dry matter intake (the amount of silage the animal can consume).

## **Materials and Methods**

A complete randomized block design experiment with seven silage corn varieties and four replications was conducted at the Maricopa Agricultural Center, Maricopa, Arizona (Table 1). These varieties were provided by several seed distributor companies. Silage corn was planted in a single row on 40-inch beds on March 29, 2011. Each plot was four rows, 50 feet long. The planting rate was 46,000/acre for each variety.

The crop required 29 inches of water from planting to harvest (Table 2). There were a total of eight irrigations. Total precipitation during the crop growth was 0.88 inches. Nitrogen (UAN 32) was applied at 210 lbs/acre; it was split with 50 lbs of N applied 55 days, 90 lbs after 76 days and the remaining 70 lbs of N applied 91 days after planting. Pre-emergent herbicide Stealth™ (Pendimethalin) applied at 3 pints per acre was the only product used during the course of the study.

Plant height was measured using a 8' graduated yardstick (Chicago steel tape). Actual height was not recorded. A picture of each variety with the yardstick was shot a few days before harvest. The yardstick was placed in one of the middle two rows before taking a picture (Figure 1). The crop was harvested on July 13, 2011 (104 days after planting) when average whole plant moisture ranged from 57% to 70% and kernel milk line was between one-half and two-thirds for most varieties. Only the two middle rows were green chopped with a Hesston 7155 chopper. The silage was saved in a bulk sack to record plot yield. A sample from each replication was collected for quality analysis. Silage yield was adjusted to a standard of 72% moisture. Percent moisture, crude protein, ADF, and NDF from each sample were analyzed.

## **Results and Discussion**

There were seven varieties that were tested, only one of them being a conventional. The variety that yielded the most with 30.35 t/ac at 72% moisture was 28Z47 (Golden Acres), however it was not significantly different from the three other varieties that were also in the same group TMF-2L-872 (Mycogen), 851VT3 (CropLanGenetics) and DKC67-88 (Monsanto-Dekalb) (Table 3).

Plant height ranged between 6' to 7' (Figure 1). This study did not show any significant difference among any of the varieties tested with respect to crude protein. CP ranged from 8.13% the highest in 28V71 (Golden Acres), to 7.44% the lowest in 28Z47 (Golden Acres). Acid detergent fraction saw the varieties fall into three groups. CropLanGenetics 851VT3 had the lowest value at 24.27% with 3 other varieties in the same group. The conventional variety Conv9009 had the highest ADF at 28.35% though not significantly different from 28Z47, F2F622 and DKC67-88. Neutral detergent fraction which is an estimate of cell wall fraction and hemicellulose had the varieties tested fall into one of the two groups. CropLanGenetics 851VT3 again had the lowest value 39.83% though they were not significantly different from TMF-2L-872, 28V71 and DKC67-88 which were clustered together. Mycogen F2F622 had the highest NDF at 44.98% not significantly different from any of the others tested.

## **Conclusion**

The study showed that there was no clear winner, a variety that had all the best traits. The best yielder in this study 28Z47 from Golden Acres but had ADF and NDF higher than some varieties. The varieties that displayed low ADF and NDF and high crude protein were not the best yielders. Though one should not draw conclusions based on a yield trial at one location, and it is best to compare the performance at other locations, and other states, there are some good choices that came out of this study. Overall, varieties that had a lower ADF and NDF, high crude protein and reasonably good yield were 851VT3 (CropLanGenetics), TMF-2L-872 (Mycogen) and DKC67-88 (Monsanto-Dekalb) were better than other varieties tested at this location.

## References

USDA-NASS. 2010. 2010 Arizona Agricultural Statistics.

Table 1. Silage Corn Varieties included in the trial and the sources

Variety Name	Company
851VT3	CropLan Genetics <sup>1</sup>
Conv 9009	CropLan Genetics
28V71	Golden Acres Genetics <sup>2</sup>
28Z47	Golden Acres Genetics
DKC67-88	Monsanto/Dekalb <sup>3</sup>
F2F622	Mycogen <sup>4</sup>
TMF-2L-872	Mycogen

More information about these varieties is available from the following websites:

<sup>1</sup><http://www.croplangenetics.com/FINDSEED/CORNSILAGE/FILTER/default.aspx>

<sup>2</sup><http://www.gaseed.com/index.php/products/test-sub-menu/optimalsilage>

<sup>3</sup><http://www.asgrowanddekalb.com/products/corn/SpecialtyMarkets/Pages/SilageProven.aspx>

<sup>4</sup><http://www.mycogen.com/Silage-Specific/SitePages/Hybrids.aspx>

Table 2. University of Arizona - 2011 Silage corn variety trial test description  
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Test Description						
Location  County: Maricopa  Longitude: 111963837 Latitude: 33.062827 Elevation: 1184.4 ft Casa grande sandy loam Soil name: loam Soil depth: >60"	Management Practices:			Growing conditions:		
	Previous crop:	Cotton		Av		
	Planting date:	Mar		Temp	Precip	Irrigation
	Harvest date:	13-Jul		F	in	in
	Production Inputs			January	49	
				February	50	0.4
				March	63	0.05
				April	70	0.32
				May	75	7.63
				June	87	18.3
Test Design  Replications: 4  Plot length: 50 ft Rows per plot: 4 Row spacing: 40 in  Harvested rows: 2 rows 50' long Seed rate: 46,000 /ac Alleys: 10 ft	Fertilizer:					
		Rate	Date			
	Nitrogen	50 lbs	23-May	July	91	4.82
	Nitrogen	90 lbs	13-Jun	August	93	0.04
	Nitrogen	70 lbs	28-Jun	September	85	0.39
	Herbicides:			October	72	0.07
	Stealth	3 pt/ac	28-Mar	November	57	0.55
	Insecticides:			December	46	1.25
	None			Precipitation		0.77 in
				Irrigation		38.15 in

Table 3. Yield and quality of seven silage corn varieties

<b>Variety</b>	<b>Yield*</b> <b>(ton/A)</b>		<b>Crude protein (%)**</b>		<b>NDF</b> <b>(%)</b>		<b>ADF</b> <b>(%)</b>	
28V71	23.99	d	8.13	a	41.71	a,b	24.42	c
28Z47	30.35	a	7.44	a	44.94	a	28.34	a
851VT3	28.32	a,b	7.99	a	39.83	b	24.27	c
Conv9009	25.36	c,d	7.53	a	44.85	a	28.35	a
DKC67-88	28.25	a,b	7.68	a	41.78	a,b	25.81	a,c,b
F2F622	21.30	e	7.80	a	44.98	a	27.54	a,b
TMF-2L-872	28.98	a,b	7.97	a	41.20	a,b	25.09	c,b

\*Crop yield was adjusted to 72% moisture.

\*\* All percentages in the table are on a dry matter basis.



Figure 1. Plant height of seven varieties tested. The graduated stick is 8' tall, the lower arrow points to 6' and the upper arrow at 7'.