

Stalk Nitrate Test Results for New York Corn Fields from 2007 through 2014

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Since the introduction of the corn stalk nitrate test (CSNT) as an end-of-season evaluation tool for nitrogen (N) management in 2nd or higher year corn fields, the number of fields that have been tested for CSNT has been on the increase. The greatest benefit of this test is that it allows evaluation and fine-tuning of N management for each specific field. It does, however, require multiple years of testing to gain experience with on-farm interpretation. Corn stalk nitrate test results >2000 ppm indicate there was significantly more N available during the growing season than the crop needed.

The summary of CSNT results for the past eight years is shown in Table 1. In the 2013 and 2014 growing season, the CSNT testing results from the Nutrient Management Spear Program and Dairy One were summarized to obtain a distribution of CSNT categories in New York State. Quality control samples shared between the two laboratories in both years showed excellent consistency in reported data between the two laboratories. Data prior to 2013 reflect submissions to Cornell University only. For 2014, this summary shows that about 36% of all tested fields were over the 2000 ppm range, while 27% were over 3000 ppm and 14% exceeded 5000 ppm. In contrast, 29% of the 2014 samples tested low in CSNT. For 2nd or higher year corn fields, low test results (less than 250 ppm) are likely to reflect a true N deficiency. Weed pressure, disease pressure, lack of moisture, lack of oxygen and other stress factors can impact the N status of the crop, so in some circumstances, additional N might not have been able to overcome the real reason for the low CSNTs (e.g. no amount of N fertilizer can make up for a drought).

As mentioned, the CSNT is most effective when used for multiple years on the same fields to determine how each responds to the way N is being managed. Crop history, manure history, other N inputs, soil type, and growing conditions all impact CSNT results, and crop management records that include these pieces of information can be used to evaluate CSNT results and determine where changes can be made.

Table 1. Distribution of CSNT values for New York State corn fields sampled in 2007-2014.

Corn stalk nitrate test category	2007	2008	2009	2010	2011	2012	2013	2014
	%	%	%	%	%	%	%	%
Low (<250 ppm)	12	19	30	24	21	20	35	29
Marginal (250-750 ppm)	13	12	14	17	19	17	16	16
Optimal (>750-2000 ppm)	26	22	21	19	24	22	20	19
Excess (>2000 ppm)	49	48	35	40	36	41	29	36
Excess (>3000 ppm)	34	36	22	28	24	29	20	27
Excess (>5000 ppm)	21	20	11	14	12	14	9	14
Total number	105	252	367	509	765	923	1473	1175
Maximum value (ppm)	14933	13069	11723	13966	16687	15671	13147	14659

Note: 2013 data included results from NMSP (924 samples) and Dairy One (549 samples); 2014 data included 521 samples from NMSP and 654 samples from Dairy One.