

## RESULTS OF AMERICAN CRYSTAL'S 2002 OFFICIAL CODED VARIETY TRIALS

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**American Crystal's coded variety trials are designed to provide an unbiased evaluation of the genetic potential of sugarbeet variety entries under several different environments. The three-year average of these evaluations are then used to establish a list of approved varieties which ensures the use of high quality, productive varieties to maximize returns for growers and the cooperative as a whole.**

This report presents data from the 2002 American Crystal and Minn-Dak official trials and describes the procedures and cultural practices involved in the trials.

| Table         | Area     | Information in the Table  |
|---------------|----------|---|
| 1             | ACS      | ACS approved varieties for 2003   |
| 2 & 3         | ACS      | Three-year performance of approved varieties - all districts                          |
| 4-Mhd – 4-Dtn | ACS      | Three-year performance of approved varieties -individual factory districts            |
| 5             | ACS      | Performance of approved varieties with commercial seed – all districts                |
| 6-Mhd – 6-Dtn | ACS      | Performance of approved varieties with commercial seed – individual factory districts |
| 7             | ACS      | Two-year performance of all approved varieties (including specialty) – all districts  |
| 8             | ACS      | Performance of specialty varieties under Aphanomyces and Rhizomania conditions        |
| 9             | ACS      | 2002 ACS Commercial trial – all characters  |
| 10            | ACS      | 2002 ACS Semi-commercial trial – all characters                                       |
| 11 & 12       | ACS & MD | Biotech variety performance   |
| 13            | ACS & MD | Seed companies in 2002 official trials  |
| 14            | MD       | Minn-Dak approved varieties for 2003  |
| 15 & 16       | MD       | Three-year performance of approved varieties – Minn-Dak                               |
| 17            | MD       | 2002 Minn-Dak Commercial trial – all characters                                       |
| 18            | MD       | 2002 Minn-Dak Semi-commercial trial – all characters                                  |
| 19            | ACS & MD | Aphanomyces disease nursery ratings   |
| 20            | ACS & MD | Cercospora disease nursery ratings  |
| 21            | ACS & MD | Official trial locations, planting and harvest dates                                  |
| 22            | ACS & MD | Grower fall soil test results for 2002 official trial locations                       |
| 23            | ACS      | Aphanomyces incidence at ACS trial sites  |
| 24            | ACS & MD | Herbicides applied to 2002 official trials  |
| 25            | ACS & MD | Fungicides applied to 2002 official trials  |
| 26            | ACS      | Approval calculations for ACS unlimited market  |
| 27            | ACS      | Approval calculations for ACS test market   |
| 28            | ACS      | Approval calculations for ACS Aphanomyces specialty                                   |
| 29            | ACS      | Approval calculations for ACS Rhizomania specialty                                    |
| 30            | ACS      | Approval calculations for ACS Rhizoctonia specialty                                   |
| 31            | ACS      | Approval status for ACS biotech   |
| 32            | MD       | Approval calculations for Minn-Dak  |

### *Procedures and Cultural Practices*

Seven sugarbeet seed company groups participated in the 2002 coded variety testing program (Table 13). Testing was conducted both in the Crystal and Minn-Dak areas of the Red River Valley by American Crystal Sugar Company personnel at the Technical Services Center.

All Crystal and Minn-Dak entries were coded at the NWROC under the direction of Dr. Larry Smith and Mr. Todd Cymbaluk. The seed was then sent to the American Crystal Technical Services Center at Moorhead for official testing.

Cooperators from each factory district within the Crystal and Minn-Dak growing areas continue to be rotated on a three-year basis, for a wider testing base.

Soil test results at all test sites were obtained from the growers and may have been sampled differently and analyzed at different labs. This information only can be related to the current year's results, not the three-year summary results.

The number of testing sites planted in the Crystal area remained at 11 (2 within each factory district and 3 for the Drayton district) with six (seven semi-commercial) of the best harvested. We continued plant-to-stand trials (5.3 inch spacing) to evaluate the commercial coded entries, in six replications. The semi-commercial trials remained as plant-to-thin trials with seed spaced at 2.6 inches, with four replications. Aphanomyces and Rhizomania specialty trials were planted at two locations each with disease present. The Minn-Dak area continued with three locations. Plots were planted crosswise (90°) to the cooperators' normal farming operations. Row spacing remained at 22 inches. Plot rows for all official trials were maintained at 44 feet with about 39 feet harvested. A lattice plot design was used for all coded trials. Planting was performed with two vacuum planters, which included a 12-row Hege plot planter and a modified 12-row Heath planter. These planters gave excellent spacing and singling which contributed to easier emergence counts and thinning. Emergence counts were taken from a 12 foot center section of two rows of each plot to be harvested. Multiple seedlings were counted as a single plant if they emerged less than one inch apart. Thinning of the semi-commercial plots occurred during the four to six leaf stages. Plants were thinned to 8 inch (150 beets/100 feet) spacing. The stands in the plant-to-stand commercial coded trials were refined by removing doubles (multiple seedlings less than one inch apart) by hand but were not further reduced.

Micro rate herbicides and full rates of fungicides were applied using a pickup sprayer driven crosswise down the alleys. All ground spraying was conducted by American Crystal Sugar technical staff. Stinger damage at one Hillsboro site resulted in the abandonment of that location.

All plot rows were measured for total length (after approximately 2.5 feet at each end were rototilled off about September 1) while skips greater than 30 inches were measured for adjustment purposes. Adjustments in the plant-to-stand trials were made only when gaps exceeded 5 feet. Harvest was performed with two modified two-row harvesters (808 Farmhand and 231 John Deere). The center two rows were harvested with no adjustments made for gaps. Several sites had four rows harvested to compensate for the loss of replications due to adverse weather conditions. All beets from both rows of each plot were used for yield determination while one sample for sugar and impurity analysis was sub sampled from each plot. Quality analysis was performed at the American Crystal Technical Services quality lab in Moorhead.

All coded herbicide resistant biotech trials were conducted as separate tests along side the regular coded trials. Entries were placed in six-row plots and replicated six times. The center four rows were sprayed with the corresponding herbicide (Roundup) and the center two rows harvested for yield, sugar, and impurities. The four regular commercial checks were sprayed with conventional sugarbeet herbicides as needed. Three applications of Roundup were made: 1) before thinning in the cotyledon to 2 leaf stage, 2) at approximately the 2-6 leaf stage and 3) at the 6-14 leaf stage. All biotech beets were destroyed following yield evaluation.

The 2002 coded trials had good stands. Trials at Perley, Hallock and Breckenridge were replanted. Trials at Glyndon, Ada, Hillsboro, Hillsboro Aph, Hallock and Tintah were not harvested. Only the semi-commercial trial at Gentilly was harvested.

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