



## **Celery Field Trials – Canada-Saskatchewan Irrigation Diversification Centre, Outlook SK**

Celery is a high value, cool-season, shallow rooted vegetable. It is a heavy feeder and poor forager of nutrients and believed to be the most demanding for nutrients of the cool season vegetables. It is estimated that celery does best at 245-290 pounds N per acre, 245-290 pounds P<sub>2</sub>O<sub>5</sub> per acre, and 440-490 pounds K<sub>2</sub>O per acre.

This study, conducted in the summer of 2009, was designed to examine the effectiveness of EarthRenew organic matter fertilizer (OMF) as an amendment for improving soil properties, moisture holding capacity and the nutrient replacement potential with celery grown under drip irrigation. Celery (Utah-5270) was specifically chosen for this study as it represents a high value vegetable grown on the Canadian prairies.

Treatments included five levels of EarthRenew (0, 2, 4, 6, and 8 tons per acre), three levels of fertilizer (Full rate, i.e. 265 pounds N per acre, 265 pounds P<sub>2</sub>O<sub>5</sub> per acre; 75% of full rate, and 50% of full rate). OMF and all the P and K fertilizer were applied at planting. Nitrogen was applied in three split applications, i.e. 50% at planting and 25% each at four and eight weeks after planting. The transplants were spaced at 24 inches between rows and 6 inches within the row. The crop was raised using drip irrigation targeted at keeping soil moisture status above 50%-60% of Field Capacity. The crop was harvested at maturity. Heads were trimmed and cleaned according to Ontario Ministry of Agriculture Food and Rural Affairs standards (Farm Products and Grades Sales Act). Marketable heads consisted of Canada Grade 1 celery with a minimum stalk length of 12 inches, average minimum midrib length of 7 inches, and a minimum diameter of 2 1/2 inches to 3 inches.

Results of the study included:

- Application of higher rates of OMF generally improved soil nitrogen levels at planting. The spring (after OMF and fertilizer application) soil nitrogen was highest for 6 tons per acre OMF. There was very little residual nitrogen in the soil at harvest period indicating that a considerable portion of nitrogen was utilized by the crop.
- Application of OMF did not show any identifiable trends on soil phosphorus and potassium levels in the spring. The soil phosphorus and potassium levels were generally lower in the fall compared to spring, for the corresponding OMF/fertilizer treatments, and the change was more marked for potassium than phosphorus.
- No statistically significant differences were found for OMF and fertilizer effects with respect to marketable yield and average weight of marketable heads in this study. This may be due to maintenance of full moisture requirements.
- Marketable yield of celery heads ranged between 33 and 45 tons per acre. Highest marketable yields of 45 tons per acre were obtained for 2 tons per acre OMF application when applied with 50% and 75% of recommended fertilizer rate.
- The average weight of marketable heads ranged between 1.41 and 1.83 pounds. The highest marketable heads, of 1.83 pounds average, was obtained with 2 tons per acre OMF and 75% of recommended fertilizer rate.

Though there was no significant yield differences in response to the effects of OMF and fertilizer rate, it was noted that 50% fertilizer rate and no OMF produced the lowest yield of 33 tons per acre. OMF amendment resulted in yield increase, ranging between 37 to 45 ton per acre. This suggests that standard fertilizer rates could be reduced by 50% and maintain yields with the addition of organic matter fertilizer.