

Making economic fertilizer decisions in canola

Each year, canola growers aim to establish the optimum nitrogen (N) fertilizer rate, based on the balance between fertilizer and canola prices. They also need to consider the canola genetics because hybrids are higher yielding. Data from a series of experiments conducted by Western Cooperative Fertilizers was analyzed to help shed light on optimum fertilizer N rates for open pollinated and hybrid canola.

The series of experiments from across western Canada compared the yield response of hybrid and open-pollinated canola for up to 12 different levels of N fertilizer.

The economic analysis looked for the optimum N fertilizer rate, based on N prices ranging from \$0.25 per kg N to \$1.25 per kg N (\$0.11 to \$0.57 per lb) and canola prices from \$200 to \$400 per tonne (\$4.54 to \$9.07/bu).

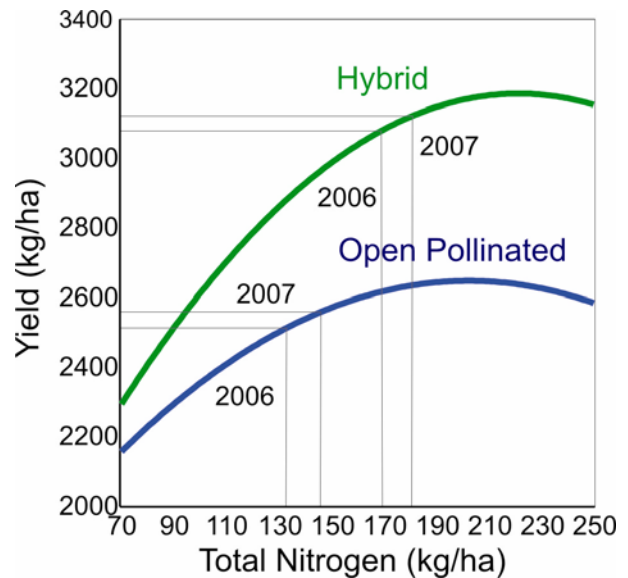
The analysis confirmed that N fertilizer was more productive for hybrid than open-pollinated canola, and it was economic to apply higher N rates on hybrids. For example, the economically optimal rate of total N when calculated using \$ 1.25 per kg N (\$0.57/lb) and \$350 per tonne (\$7.94/bu) canola, was found to be 138 kg N per ha (123 lb/ac) for open-pollinated and 175 kg per ha (156 lb/ac) for hybrid canola.

Despite differences in the optimal N fertilizer rate, the change in optimal rate due to a given change in N price was very similar for open pollinated and hybrids. In looking at the analysis, while hybrids were found to be more agronomically responsive to N, their economic response to changing fertilizer and canola prices were similar to open-pollinated canola, as shown by the example in Figure 1. Hybrid and open-pollinated varieties display similar yield responses to additional nitrogen.

The figure shows yield response curves for hybrid and open-pollinated cultivars against total N rate (soil plus applied) in kg per ha at Fort Saskatchewan, AB. Optimal fertilizer N rates were estimated for 2007 with \$380 per tonne (\$8.62/bu) canola and \$1.15 per kg N (\$0.52/lb), and for 2006 with \$250 per tonne (\$5.66/bu) canola and \$1.00 per kg (\$0.45/lb) N.

A given change in N price had a larger impact on optimal N rate at lower canola prices. For both cultivars, optimal N rates based on projected prices in the spring

of 2007 were higher than in 2006. Canola and N prices were higher in 2007. Even though the 2007 canola prices were much higher than 2006, the additional N compared to 2006 was moderate because N prices were higher. With the slightly higher N rate for 2007, canola yield was also projected to be slightly higher as well.



Impact of N fertilizer price on optimal N rate (soil plus fertilizer) and canola yield at Fort Saskatchewan, AB.

Source: Upadhyay, B., Smith, E., Karamanos, R. 2006 Economic evaluation of fertilizer decisions in hybrid and open-pollinated herbicide-resistant canola (*Brassica napus*). Working paper.

Note: 2007 canola price = \$380/t, N price = \$1.15/kg; 2006 canola price = \$250, N price = \$1.00/kg.
Conversions: kg/ha x 0.89 = lb/ac; \$/t divided by 44.1 = \$/bu; \$/kg divided by 2.2 = \$/lb.

The research highlights the importance of the genetics of the canola, and the interaction between fertilizer N and canola prices that canola producers must consider to maximize net returns. By working with soil test labs and local agronomists, growers will be able to target maximum economic yield of canola, rather than simply targeting maximum agronomic yield.