



Fertilizer and Lime Recommendations for Canola in Oklahoma

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Canola is a relative new crop to Oklahoma, therefore, few field studies have been conducted in the state to evaluate its nutrient needs and pH suitability. Research conducted in other states and other countries suggests that nutrient needs of Canola are similar to those of small grains except that canola requires slightly higher soil pH, more nitrogen and more sulfur than winter wheat. This publication highlights the fertilizer and lime recommendations for Canola production modified from the well established recommendations for small grains. Refer to OSU F-2225 for more complete information on soil test interpretations.

Nitrogen (N) Requirement: The amount of N needed is directly related to the yield goal. Yield goals should be sufficiently greater than long-term average yields to insure nitrogen will not be the factor limiting crop production during years with better than average growing conditions. As a rule of thumb, the average of the three highest yields from the last five years is an appropriate yield goal. The nitrogen fertilizer rate is calculated by subtracting the soil test N value from the nitrogen requirement for a yield goal listed in Table 1. Excessive preplant N levels may reduce canola's winter hardiness. Therefore, it is recommended to apply 1/3 (or 35 to 50 lbs/A) of the total N preplant and the remaining N as a topdress in the spring.

Nitrogen requirement for canola can be calculated using the following equation if soil is tested:

N (lbs/acre) = 0.05 x yield goal (lbs/A) - soil test N (lbs/A)

Table 1. Nitrogen requirement for winter canola production in Oklahoma.

Table with 2 columns: Yield Goal (lbs/A) and N requirement (lbs/A). Rows include values for 1000, 1500, 2000, 2500, 3000, and 3500 lbs/A yield goals.

Phosphorus and Potassium Recommendations are shown in Table 2 and 3. Both phosphorus (P) and potassium (K) fertilizers should be applied in the fall before or at planting. Banding fertilizers (e.g., DAP or KCl) with canola seeds may cause injury to seeds and seedlings if the distance between fertilizer and seeds is inadequate. Do not band apply fertilizers with the seeds if you are not sure whether injury is a problem.

Table 2. Phosphorus requirement for winter canola production in Oklahoma using Mehlich 3 extraction.

Table with 3 columns: P Soil Test Index, Percent Sufficiency, and P2O5 (lbs/A). Rows show requirements for soil test indices from 0 to 65+.

Table 3. Potassium requirement for winter canola production in Oklahoma using Mehlich 3 extraction.

| K Soil Test Index | Percent Sufficiency | K ₂ O (lbs/A) |
|-------------------|---------------------|--------------------------|
| 0 | 50 | 60 |
| 75 | 70 | 50 |
| 125 | 80 | 40 |
| 200 | 95 | 20 |
| 250+ | 100 | 0 |

Sulfur Requirement: Sulfur is a mobile nutrient in the soil, therefore, plant requirements are based on yield goals similar to that of nitrogen. Sulfur requirements for non-legumes are calculated by dividing the nitrogen requirement by 20. The available sulfur measured by the sulfur soil test for both the surface and subsoil is subtracted from the sulfur requirement to determine sulfur fertilizer rate. The rate may also be reduced by an additional 6 lbs/acre due to sulfur supplied through rainfall and other incidental additions such as N, P, and K fertilizer impurities. Sulfur is generally not deficient for any crop in Oklahoma. A study conducted in 2000 showed an average of 38 lbs/A of sulfate-sulfur (SO₄-S) in the top six-inches of soils, and 129 lbs/A in the top 24 inches (Zhang, 2000). Field trials are needed to further evaluate the sulfur needs of canola in Oklahoma.

Lime Recommendation (Table 4) for canola is based on soil pH and buffer index of the soil sample.

Table 4. Lime rates for canola production in Oklahoma. No lime is recommended when soil pH is 5.8 and higher no matter what the buffer index is.

| Soil Buffer Index | ECCE* Lime (tons/A) |
|-------------------|---------------------|
| 6.2 | 4.2 |
| 6.3 | 3.7 |
| 6.4 | 3.1 |
| 6.5 | 2.5 |
| 6.6 | 1.9 |
| 6.7 | 1.4 |
| 6.8 | 1.2 |
| 6.9 | 1.0 |
| 7.0 | 0.7 |
| 7.1 | 0.5 |
| 7.2+ | 0.0 |

*Effective Calcium Carbonate Equivalent - Pure calcium carbonate ground fine enough to be 100% effective. The rate of ag-lime to apply can be determined from the ECCE requirement using the following formula:

$$\text{Tons of ag-lime / A} = \text{Tons ECCE lime required} / \% \text{ECCE}$$

References:

1. Zhang, et al. 1998. OSU Soil Test Interpretation. OSU Extension Facts F-2225.
2. Zhang, H. 2000. Soil Chloride, Nitrate, and Sulfate in Oklahoma Soils. PT 2000-1.

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