



## 2013 OILSEED MEAL AS A FERTILITY AMENDMENT IN SWEET CORN

Dr. Heather Darby, University of Vermont Extension

[heather.darby@uvm.edu](mailto:heather.darby@uvm.edu)

Many Northeast growers are integrating oilseed crops such as canola, soybeans, and sunflower into their operation, in hopes of on-farm fuel production, value-added products, and/or livestock feed. Many producers are using small-scale presses to mechanically separate oil from the seed. Oilseed meal, the high-protein byproduct left after the extrusion of oil, can be milled and used as a soil amendment to increase fertility and organic matter. This material has the potential to replace high-cost imported fertilizers, especially for organic growers.

### MATERIALS AND METHODS

A trial was initiated at Borderview Research Farm in Alburgh, Vermont to assess the effectiveness of using oilseed meals as a fertility amendment in sweet corn (Table 1). The experimental design was a randomized complete block with three replications. Treatments consisted of four fertility amendment types (three different oilseed meals and a control of synthetic Chilean nitrate) at two different application rates each (50 and 100 lbs per acre).

**Table 1. Agronomic information for oilseed meal trial, 2013, Alburgh, VT.**

Location	Borderview Research Farm – Alburgh, VT	
Soil type	Covington silty clay loam, 0	2 re3 9

**Table 2. Nutrient analysis of canola, soybean, and sunflower meals, and Chilean Nitrate.**

<b>Crop</b>	<b>Variety</b>	<b>N</b>	<b>P</b>	<b>K</b>
		<b>%</b>	<b>%</b>	<b>%</b>
Canola	5535 CL	4.8	1.0	1.2
Soybean	Boyd	6.4	0.5	1.8
Sunflower	Syngenta 3480	3.9	0.7	1.1
	Chilean Nitrate	16.0	0.0	0.0

Soil samples were collected weekly through June and July, then biweekly until harvest (25-Sep). Nitrate levels were measured in the Agricultural and Environmental Testing Lab at the University of Vermont. On 14-Aug, sweet corn populations were measured. Sweet corn was picked by hand on 25-Sep, and measurements on yield, number of ears per plot, and ear length were collected. Stalk samples were sent to the University of Massachusetts for analysis of stalk nitrate levels.

Data were analyzed using mixed model analysis using the mixed procedure of SAS (SAS Institute, 1999). Replications within trials were treated as random effects, and soil amendment treatments were treated as fixed. Mean comparisons were made using the Least Significant Difference (LSD) procedure when the F-test was considered significant ( $p < 0.10$ ).

## RESULTS

ments Vantage Pro2 weather station equipped with  
on, and accumulation of Growing Degree Days  
(Table 3). Historical weather data are from 1981-  
VT, approximately 45 miles from Alburgh, VT.  
age in the spring of 2013, when sweet corn was  
blowed under due to crop failure, and replanted 9-  
precipitation than normal. After June, however, the  
rage of 5.20 inches fewer than average in July,  
temperature of 50°F for sweet corn. Between the  
culated 1520 GDDs for corn, 19 fewer than the 30-

**corn, Alburgh, VT, 2013.**

Alburgh, VT

June

July

August

September

amendment treatment. The average nitrate levels for the trial peaked in mid-August and then decreased and leveled out by September (Figure 1).

**Figure 1. Nitrate levels from 13-Jun to 27-Sep 2013, Alburgh, VT. There was a significant difference in NO<sub>3</sub> level by treatment for six out of the nine sample dates (p=0.10). The thick black line represents the trial mean.**

There were no statistically significant impacts of soil amendment treatment on sweet corn populations, yield, or corn quality (Table 5, Figure 2). Plant populations on 14



amendments and commercial Chilean N, which can be cost-prohibitive for many organic growers, and have limited organic uses, according to NOP regulations. There were no statistically significant differences in plant populations, yield, number of ears, ear length, or stalk nitrates, indicating that oilseed meals can be used as soil amendments to produce a sweet corn crop comparable to the use of Chilean N. Interestingly, the soybean and canola meal had peak nitrate release near the time of topdress (3-Aug) indicating that the amendments needed almost 60 days to mineralize adequate nitrogen for sweet corn production. Hence,