

## Is it too early for fall soil sampling?

Currently the traditional and most reliable method of measuring available N for the crop is the nitrate soil test. Fall sampling is most common, and to be effective, it should reflect the amount of N available at planting time. Manitoba recommendations have traditionally been to “delay sampling until soils have cooled to 5°C” so that all the N that will mineralize during the fall will be detected. This has historically been in early to mid October.

But earlier fall sampling may be desirable for number of reasons:

- sampling is more likely to be done
- analysis is available for fall fertilizer prescriptions and N application
- sampling before tillage gives more consistent /reliable sample depths
- volunteer crop regrowth is less likely to hide available N from test
- can be used as an audit of the soil’s N supplying ability (after taking into account starting soil N, applied N and N removal)

Between 1999 and 2000 we evaluated the effect of early vs later sampling at 8 Manitoba locations on cereal stubble (Table 1). On average soil nitrate levels did not vary, considering that our sampling error within the plots were considered to be 10 lb N/ac. If we had been waiting for average soil temperatures to drop to 5°C, we would have delayed sampling until mid October.

Table 1. Mean soil nitrate levels of 8 MB sites.

Sampling date	Soil nitrate-N lb/ac in 0-24"	Average soil temperature at 4" (1999-2000)	
		Carman	Brandon
Early Sept	49	16° C	-
Mid Sept	53	12.5° C	11.5°C
Early Oct	47	7.3° C	8° C
Mid Oct	53	6.6° C	6° C
Early Nov	44	5.3° C	3.7° C
April	51	-	
May	60	-	

Soil nitrate levels did start to increase rapidly once spring sampling was delayed into May, due to mineralization in warm soils.

There were 2 instances where fall N levels did change from early fall sampling:

- 2" of rain on a sandy soil in late October leached some 20 lb N/ac below the 24" sampling depth
- Aggressive fall tillage (2x) on a high organic matter loam soil, increased soil N by some 25 lb N/ac

So early fall sampling is generally reliable on cereal stubble, but there remain known environmental and management factors that can still influence soil nitrate levels.

But soil sampling early just to exploit a cheap labour force before the school year starts, should not be a deciding factor (Figure 1).



Figure 1. Hand sampling to 24" may be considered inhumane depending on soil conditions.

Reference:

Heard, J and J. Lee. 2001 The Influence of Sampling Time on Fall Soil Nitrate Levels. Manitoba Agronomist Conf. [http://www.umanitoba.ca/faculties/afs/MAC\\_proceedings/2001/pdf/heard4.pdf](http://www.umanitoba.ca/faculties/afs/MAC_proceedings/2001/pdf/heard4.pdf)