

SASKATCHEWAN SOIL TESTING LABORATORY

1986-1987 Report

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The volume of samples handled by the Laboratory in 1986 for the routine farm soil tests in the spring, for the routine farm tests in the fall, and for the wide range of tests provided to other customers throughout the year, were each up 10-20% from the corresponding 1985 volumes (Table 1). Spring farm sample receipts (over 3500 fields) were at record levels, though fall farm sample volume was again depressed from potential levels due to the very late harvest and poor agricultural commodity prices.

Table 1: Numbers of Samples Received by the Saskatchewan Soil Testing Laboratory, by years; 01 July 1983 to 31 January 1987.

	1983-84	1984-85	1985-86	1986-87
	July 1 to June 30			July 1 to Jan 31
	No. of Samples (No. of fields in brackets)			
<u>Source of Samples</u>				
Soil Samples				
Farm				
Complete (0-24")	55,791 (18,597)	40,923 (13,641)	39,630 (13,210)	35,739 (11,913)
N-Only (to 24")	918 (306)	2,667 (889)	1,809 (603)	1,152 (384)
0-6" Complete	1,399 (1,399)	1,501 (1,501)	1,363 (1,363)	581 (581)
Industry, Gov't	10,088	7,081	9,149	7,767
Dept. of Soil Science	5,100	5,531	8,427	4,388
University	2,918	1,726	3,662	1,849
Gardens	234	301	280	190
Plant Samples	4,207	1,600	2,426	5,828
Water Samples	220	438	747	331
Total Samples	80,875 (20,302)	61,302 (16,031)	67,493 (15,176)	-----
Total-Fall Only	69,246 (18,161)	46,807 (12,783)	49,601 (11,509)	57,825 (12,878)

The routine Farm Soil Fertility Test Packages offered, and charges for them, were again unchanged (prices for these have been held since July, 1982):

Complete Test (0-6", 6-12" and 12-24"	\$24.00 per field
- NO ₃ -N, P, K, SO ₄ -S, pH and salinity with interpretation	
- if 0-6" sample only is provided, it is analyzed, but charge per field is not reduced.	
Nitrogen Only Test (0-6", 6-12", 12-24")	\$15.00 per field
- NO ₃ -N only, with interpretation	

Some major instrument updating has resulted in switches to improved methods of analysis over the past year. A plasma spectrometer is now in use for major parts of the extractable micronutrient, detailed salinity, and plant tissue analyses. Ion chromatographs are being used to determine chloride and sulphate levels in association with the detailed salinity tests. A CHN analyzer and an S analyzer are in use to determine total levels of those elements in soils and plants. These are currently not involved in any of the analyses associated with the routine Farm Fertility Test Packages.

The Laboratory bulletin "Guidelines to Soil Testing in Saskatchewan" was revised and reprinted in the summer of 1986; "Fertilizer Practices for Saskatchewan" (S.S.T.L. Leaflet #1) is currently being revised.

Stubble soil nitrate-nitrogen (NO₃-N) levels returned to more normal lower levels due to the generally favourable moisture conditions during the 1986 growing season (Table 2). Average NO₃-N levels in Dark Brown and Thin Black Zones in particular were below long-term average levels. The combination of low NO₃-N levels in stubble fields of the Brown through Thin Black Zones, and better than average stored moisture conditions in those fields, results in generally high requirements for N fertilizer for stubble cropping in 1987. Fallow soil available nitrogen levels show little year-to-year variation.

The influence of regional and year-to-year variations in precipitation patterns were again evident in the NO₃-N distribution with depth. For example, average 0-24" NO₃-N levels in samples from fallowed fields of the Dark Brown Soil Zone were only slightly (5%) lower in 1986 (65 lb/Ac) than they were in 1985 (68 lb/Ac). However,

average NO₃-N levels observed in the 0-6" depth only for the corresponding fields were much lower (30%) in 1986 (18 lb/Ac) as compared to 1985 (26 lb/Ac).

Table 2: Percentage of fields submitted in two selected nitrate-N test ranges; Fall 1982, 1983, 1984, 1985, and 1986.

	More than 45 lb/Ac (0-24")					More than 60 lb/Ac (0-24")				
	1982	1983	1984	1985	1986	1982	1983	1984	1985	1986
	-----% of fields-----									
SUMMMERFALLOW										
Brown	68	64	55	68	69	40	33	28	44	41
Dark Brown	79	79	72	79	78	52	51	45	53	51
Thin Black	85	81	85	78	70	66	67	63	60	53
Thick Black	84*	90*	90*	84*	71*	61*	78*	74*	71*	61*
Gray Black	75*	57	79*	78*	70*	45*	43	58*	64*	51*
Gray	59*	60*	65*	64*	56*	31*	45*	39*	51*	39*
STUBBLE										
Brown	17	15	32	44	18	10	8	18	27	11
Dark Brown	25	24	37	27	17	14	13	23	16	10
Thin Black	26	30	32	22	12	14	17	21	13	6
Thick Black	30	32	26	16	18	17	18	14	9	9
Gray Black	15	14	8	6	9	8	8	3	3	5
Gray	12	14	9	4	9	5	7	4	2	4

*based on fewer than 300 fields; other data based on 300 to 3000 fields

NOTE: All data is from samples taken in the Fall of the indicated year only.

Low soil available sulphur (SO₄-S) test levels in soils from the Brown and Dark Brown Soil Zones were considerably more common in the fall 1986 samples than in samples of previous years. For example, almost ten percent of fields submitted from the Brown Soil Zone had SO₄-S test levels low enough to result in fertilizer sulphur recommendations for cereals. This is almost twice the average frequency of the previous two years for that zone. The good growing conditions (resulting in more S being taken up by the crop), and above average fall rainfall (leaching of SO₄-S in lighter soils?) in 1986, could explain most of the difference. However, there have been few documented yield responses to S fertilization on the Brown and Dark Brown Soils. Some field experimentation is underway to establish if S fertilization is beneficial on low SO₄-S soil of these Zones (see Tomasiewicz and Marantz 1987, this publication).