FERTILITY STUDIES.

Chemical analyses field experiments, and co-operative fertilizer tests are being carried on with a view to determining and increasing the fertility of the tobacco soils and securing profitable yields.

Every soil contains two kinds of plant food, usable, that which the plant can get without difficulty; and unusable, such as enclosed in rocks, particles and compounds. A great mass of people still believe that all that is necessary to know how to handle a soil is to have its chemical analysis made or plant food content determined. The chemist can only determine the total or arbitrarily available, usable plus unusable, plant food in the soil. The soil analysis often indicates in what direction improvement lies, whether any element is deficient, the potential food supply, and is valuable for comparative relations as to fertilizer needs, etc. Carefully conducted field experiments must give the final answer to most soil problems of fertility.

Table II gives the chemical analyses of a few of the typical flue-cured tobacco soils.

	No. 500.	No. 501.	No. 502.	No. 503.	No. 504.	No. 505	No. 506.	No. 507.
Phosphoric acid	0·11	0·08	0·09	0·05	0·11	0·08	0·06	0·03
Nitrogen	0·02	0·03	0·06	0·04	0·04	0·04	0·03	0·05
Potash	0·016	0·019	0·13	0·21	0·21	0·22	0·08	0·10
Lime	0·12	0·08	0·08	0·11	0·07	0·67	0·06	0·06
Magnesia	0·06	0·06	0·03	0·14	0·10	0·02	0·08	0·08
Alumina and Iron Oxide.	2·10	2·12	1·46	1·63	4·10	4·15	2·10	3·19
Insoluble and soluble Silica	95·22	95·86	97·79	94·47	95·48	94 75	95·88	95·01
Loss on ignition	1·79	0·80	1·34	0·93	1·68	1·24	1·17	0·94

	No. 508.	No. 509	No. 510.	No. 511.	No. 512.	No. 513.	No. 514.	No. 515.
Phosphoric acid	0·10	0·08	0·08	0·08	0·08	0·03	0·03	0·08
Nitrogen	0·02	0·05	0·04	0·02	0·06	0·04	0·03	0·01
Potash	0·21	0·18	0·10	0·12	0·08	0·13	0·25	0·33
Lime	0·07	0·12	0·08	0·06	0·06	0·04	0·03	0·14
Magnesia	0·05	0·13	0·06	0·07	0·04	0·03	0·09	0·21
Alumina and Iron Oxide	2·15	2·39	1·90	2·12	0·88	3·90	3·62	4·35
Insoluble and soluble Silica.	94·75	95·33	94·46	95·92	97·01	95·07	93·16	93·00
Loss on ignition.	1·99	1·06	2·02	0·98	1·65	0·97	2·45	1·56

	No. 516.	No. 517.	No. 518.	No. 519.	No. 520.	No. 521.	No. 522.	No. 523.
Phosphoric acid	0·12	0·08	0·06	0·05	0·09	0·08	0·08	0·05
Nitrogen	0·28	0·03	0·03	0·02	0·06	0·03	0·06	0·02
Potash	0·74	0·81	0·10	0·11	0·22	0·22	0·20	0·26
Lime	0·29	0·30	0·08	0·09	0·04	0·05	0·09	0·10
Magnesia	1·14	0·20	0·02	0·05	0·06	0·08	0·08	0·09
Alumina and Iron Oxide	5·10	3·25	2·21	3·01	2·90	3·20	4·00	4·62
Insoluble and soluble Silica.	85·07	92·85	95 69	95·30	94·45	94·70	93·12	93·26
Loss on ignition	8·46	1·98	1·61	1·11	2·20	1·45	2·20	1·62

DESCRIPTION OF SAMPLES.

No. 500—Surface soil, 0-6 inches, dark sand, from farm of Wm. Mills, Ruthven.

No. 501—Subsoil, 6-24 inches, light yellow sand.

No. 502—Surface soil, same farm, dark sand, 0-6 inches.

No. 503—Subsoil to 502, 6-24 inches, light yellow sand.

No. 504—Surface soil, 0-5 inches, Conover's farm, Leamington, dark brown sand.