correspond to the action of soil water, and have agreed upon a certain solution called citrate of ammonia, at a certain temperature, and acting on the fertilizer for a certain specified time, under specified manipulations. This is one method, and is called the "citrate" or "modified Washington" method, and is used by nearly all the State chemists.

Another method, called the "oxalate" or "improved Cincinnati method," gives results averaging nearly two per cent. higher, and is used by many chemists employed by manufacturers of fertilizers. Between *these two methods* there is an average variation of about two per cent. This should not be charged as chemical inaccuracy. But even among the best chemists using the same method, the "citrate" for example, with the utmost care, the variations will sometimes equal nearly or quite one per cent. (on the whole hundred), which would be ten per cent. on the *ten per cent.* of available acid usually contained in superphosphates. This is somewhat serious, and simply shows that this difficult problem has not yet been fully solved, of showing how much of the phosphoric acid is "available" as plant food under the action of soil water.

But I should like to call attention to the fact that in the actual soil the variations are vastly greater than in the chemical laboratory. In the latter, all the conditions can be carefully controlled; in the former, scarcely any of them. In a warm, rainy autumn, spring and summer, in a well-tilled soil, where the fertilizer is well distributed, *and is needed*, the first crop of wheat may take nearly all the "available" phosphoric acid contained. But in a cold dry season, an ill-tilled soil, with the fertilizer ill-distributed, the first crop may receive almost no benefit.

Secretary Thomas J. Edge, of Pennsylvania, recently gave in your columns very close results of different chemists working on the same sample, each unknown to the other. Some weeks ago I took three samples from a hundred—the brands on which there had been the most "kicking" by manufacturers last year. The samples were each well mixed but not pulverized; were divided, and one part of each sent to Dr. S. W. Johnson, of the Yale Scientific School, and Director of the Connecticut Agricultural Experiment Station, whom I consider the highest authority in agricultural chemistry, and the other part to Prof. N. W. Lord, our Ohio State Chemist. He analyzed and reported them with about a hundred others. Prof. Johnson had them analzed in his laboratory, and reported them with bill to me. All either chemist knew of the samples was that they were Nos. 5, 6 and 38, respectively; that neither claimed potash, and only 5 and 38 claimed ammonia. This information was given to save expense of useless determinations.

The results are given below, with the valuation for each brand (both analyses) at our State valuations, viz.—ammonia 18 cents per pound, soluble and reverted phosphoric acid 12½ cents per pound, and insoluble phosphoric acid 5 cents per pound.

ANALYSES AND VALUATIONS, BY PROF. S. W. JOHNSTON, OF NEWHAVEN, AND PROF. N. W. LORD, OF OHIO STATE UNIVERSITY:

| SAMPLE. | Ammonia—per cent. | Phos. Acid. Available—per cent. | Phos. Acid. Insoluble—per cent. | Phos. Acid. Total per ct. | Val. p.r ton. |
|---|---|---|---|---|---|
| No. 5, Prof. Johnson, | 0.02 | 8.89 | 6.31 | 15.20 | $31.31 |
| Prof. Lord.... | 0.05 | 9.16 | 6.08 | 15.25 | 32.36 |
| No. 6, Prof. Johnson, | 0.00 | 11.20 | 3.31 | 14.47 | 31.26 |
| Prof. Lord.... | 0.00 | 10.64 | 3.70 | 14.34 | 30.30 |
| No. 38, Prof. Johnson, | 2.11 | 7.30 | 5.35 | 12.65 | 31.20 |
| Prof. Lord.... | 2.12 | 7.12 | 5.24 | 12.36 | 30.64 |

The highest variation of total value is about one dollar per ton. In one case Prof. Lord was a trifle the highest, and in two cases Prof. Johnson is the highest.

A comparison of the analyses and valuations of 97 samples in our forthcoming July Crop Report will show that duplicate samples of the same brand of goods, drawn at different times and places, and analyzed by the same chemist, vary more than different analyses of the *same sample* by different chemists. In other words, the manufacturers vary more in making their goods than the different State chemists do in analyzing them, and greatly more than any one State chemist does using the same methods and processes on all goods submitted to him.

The July Crop and Fertilizer Report, by the Ohio State Board of Agriculture, will be ready in about a week, and will be mailed free on application to parties interested, as long as the supply lasts.—W. I. CHAMBERLAIN in *Country Gentleman*.

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E. LEWIS STURTEVANT, Director of the New York State Experimental Station, Geneva, gives in N. Y. Herald, under date July 15, his experiments on remedies for the Turnip and Cabbage Flea, which is so destructive to young plants of many kinds in Nova Scotia:—

The turnip flea beetle, *Naltica striolata* attacked our young plants of cabbage cauliflower, turnip and radish, doing much injury by eating the leaves. We have made many applications with the view of discovering the most efficient preventative against its injuries. Among these may be mentioned tobacco water, cut tobacco leaves, kerosene, soap emulsion, soluble phenyle, buhach powder and air-slacked lime. The date of each application and the proportions of each used, &c., were carefully noted and the plants upon which the applications were made were examined daily, and the number of insects found counted and noted in comparison with the number found upon plants which had received no treatment. We will not burden our readers with details, but will proceed at once to results.

A saturated decoction of tobacco water is very efficient in keeping off the insects, when frequently applied, but its strength seems to volatilize quickly in the sun, at least our figures seem to show that little, if any, benefit comes from the application after two days. Our decoction was made by soaking tobacco leaves in cold water for twenty-four hours, when the water was poured off to be used, and was applied by means of the garden sprinkler.

We found the kerosene emulsion diluted with eight parts of soft water to be very efficient, but its effects are little, if any, more lasting than are those of the tobacco water, and when frequently applied it evidently retarded the growth of the plants. This emulsion is made by combining one gallon of kerosene, one gallon of water and four pounds of common yellow bar soap, heating the mixture with occasional stirring, until the mass becomes homogeneous, and then continuing the stirring till it becomes cold. This preparation is entirely permanent, and may be diluted to any extent by the addition of rain water.

Tobacco leaves cut fine by passing them through a fodder cutter and placed about the plants of radish had a very visible effect in keeping off the *Naltica*, the appearance of the leaves showing the beneficial result It may be noted of the application of tobacco, whether in the form of leaves or decoction, that it stimulated the growth of the plant as well as protected from the insect.

Air slacked lime dusted over the plants while wet with dew is unquestionably beneficial, and in dry weather its effects are quite lasting.

We tried also kerosene mixed with sand, at the rate of one ounce of the former to a pound of the latter, but the mixture had little influence in protecting from the insect, while it was detrimental to the growth of the plant.

Buhach powder mixed with alcohol, and this mixture reduced with water, was applied in different degrees of dilution without marked effect.

Soluble phenyle proved nearly or quite valueless, for when applied in sufficient concentration against the beetles it injured or destroyed the plants.

It is well to note that plants grown in a frame made of twelve-inch boards were not perceptibly injured by the beetle. This insect, though very agile, rarely jumps high, hence in many cases we may