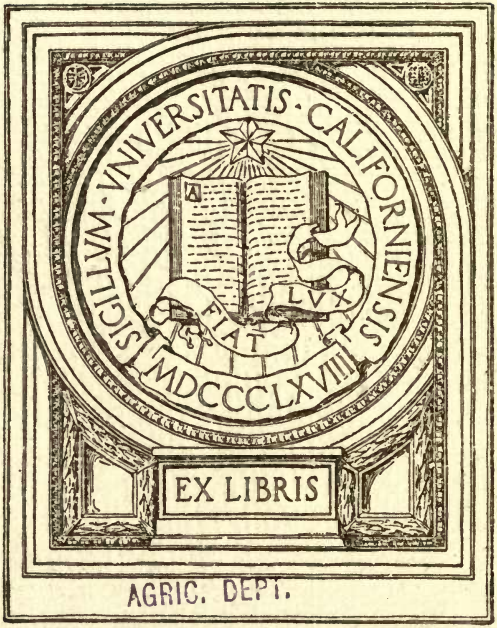
FERTILIZING TOBACCO

GERMAN KALI WORKS



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Fertilizing Tobacco.

TOBACCO is a rank, rapid growing, and heavy-feeding plant, and requires liberal supplies of plant food. The careful experiments of Dr. Goessman, of the Massachusetts (U. S. A.) Experiment Station, and of Prof. Stockbridge, of the Florida Experiment Station, furnish information of great practical value to the planter.

As a result of these investigations, the quantities of Phosphoric Acid, Nitrogen and Potash per acre, suggested by these two authorities, are as follows:

	PHOSPHORIC ACID	NITROGEN	POTASH.
Dr. Goessman,	60 lbs.	100 lbs.	300 lbs.
Prof. Stockbridge,	73 lbs.	180 lbs.	300 lbs.
Average per acre,	67 lbs.	140 lbs.	300 lbs.

A mixture of 600 lbs. of high-grade Sulphate of Potash, (96%), 850 lbs. of Nitrate of Soda and 550 lbs. of Acid Phosphate (12%) would just about furnish the amounts of Phosphoric Acid, Nitrogen and Potash mentioned above.

The plant food found by chemical analysis in the tobacco plant, furnishes a fair guide in determining the kind and amount of fertilizer to use. Of course, not only the leaf, but the whole plant must be accounted for in figuring out the actual plant food taken up. While the leaf is the object of tobacco growing, the leaf cannot be

grown without the stalk, roots ,etc. The analyses of the whole plant made by Prof. Stockbridge indicate the following plant food requirements. He found the average Florida tobacco plant to contain:

PHOSPHORIC ACID	NITROGEN	POTASH
0.99 per cent.	2.58 per cent	4.34 per cent.

This indicates that the crop requires its plant food in the proportion of 260 lbs. of Nitrogen and 440 lbs. of Potash for every 100 lbs. of Phosphoric Acid actually taken up by the plant. As Phosphoric Acid is apt to change into insoluble forms in the soil, allowance must be made for such losses in making up special fertilizers. Again, many soils accumulate supplies of Nitrogen through the growth of legumes in rotation, and a too free supply of Nitrogen in the fertilizer, may prove very undesirable by inducing a too rank growth of leaf. For these reasons, many experienced tobacco growers use a higher proportion of Phosphoric Acid, and a lower proportion of Nitrogen than the chemical composition of the crop would seem to require.

Prof. Stockbridge's recommendation for fertilizer application is based on these conditions, and his formula supplies the necessary plant foods, (as shown by the analyses) which will be removed from an acre of land by a fair crop of tobacco.

The conclusions of accepted authorities may be thus stated; *The demands of the crop for Phosphoric Acid are*

small, for Nitrogen they are large, but the greatest demand is for Potash, in fact, greater than that of any other cultivated plant.

The general rule for practice for tobacco planters to follow may be stated thus: Nitrogen 4 to 6 parts, Potash 8 to 15 parts, and Phosphoric Acid 1 to 3 parts.

This may be more concisely expressed as follows:

Ammonia, . . .	4 to 5 per cent.
Potash, . . .	8 to 9 per cent.
Available Phosphoric Acid,	2 to 4 per cent.

Commercial fertilizers are valuable as plant food only to the extent that they contain Nitrogen, Potash and available Phosphoric Acid, provided always that proper proportions of these ingredients are used. An excessive amount of any one of these three plant foods in a fertilizer will not make up the loss caused by the lack of either of the other.

The sources from which the different forms of plant food are obtained is of the utmost importance in affecting the results. In selecting Potash, *Sulphate of Potash* should always be applied; that grade known as 96% Sulphate of Potash would be the best suited for the purpose. The forms of Potash such as Muriate of Potash and Kainit, both of which contain large quantities of chlorine, should never be used for tobacco, as they exert an injurious influence on the burning quality of the leaf.

To make a fertilizer of the composition recommended,

that is, 5% of Ammonia, 9% Potash and 4% Available Phosphoric Acid, which is a well balanced mixture for tobacco, the following materials can be used to make a ton.

Cotton Seed Meal, . .	1100 lbs.
Sulphate of Potash (96%),	350 lbs.
Acid Phosphate, . .	550 lbs.
	2000 lbs.

As to the amount of the above mixture to be applied per acre, this varies in different countries. On an average, though, from 1000 to 1500 lbs. per acre could be used to advantage. In Connecticut, the tobacco planters as a rule, use as much as 3000 lbs. per acre of a fertilizer of even higher grade than that above recommended. A little experimenting on the part of each planter, however, will soon indicate the amount which can be used with the greatest profit.

TOBACCO UNFERTILIZED. EXPERIMENT FARM, SOUTHERN PINES, N. C.

TOBACCO. FERTILIZED WITH POTASH, PHOSPHORIC ACID AND NITROGEN (COMPLETE FERTILIZER)—EXPERIMENT FARM, SOUTHERN PINES, N. C.

Composition of Fertilizer Materials Used as Sources of Nitrogen.

	Nitrogen. Per Cent.	Equivalent in Ammonia. Per Cent.	Potash (K_2O.) Per Ct.	Phosphoric Acid Total. Per Cent.
Nitrate of Soda	15 to 16	18 to 19½	.....	.....
Sulphate of Ammonia	19 " 22	23 " 26	.....	.....
Dried-Blood (high grade)	12 " 12½	14½ " 17½	.....	.....
Dried-Blood (low grade)	10 " 11	12 " 14½	.....	3 to 5
Concentrated Tankage	11 " 14½	13½ " 15	.....	1 " 2
Tankage	5 " 6	6 " 7½	.....	11 " 14
Tankage	7½ " 9	9 " 11	.....	8½ " 10½
Dried Fish Scrap	9½ " 11	11½ " 13½	.....	6 " 8
Cotton Seed Meal	6½ " 7½	8 " 9	1½%	2%
Castor Pomace	5 " 6	6 " 7½	1%	2%
Tobacco Stems	2 " 3	2½ " 4	5 to 8	about 1%

Composition of Fertilizer Materials Used as Sources of Phosphoric Acid.

	Nitrogen. Per Ct.	Equivalent in Ammonia. Per Ct.	Potash (K_2O.) Per Ct.	Phosphoric Acid.		
				Total. Per Ct.	Available Per Ct.	Insoluble Per Ct.
So. Carol'a Phos. Rock	.....	.....	.....	26 to 27	.....	26 to 27
So. Carolina Acid Phosphate	.....	.....	.....	13 " 16	12 to 15	1 " 3
Florida Land Rock	.....	.....	.....	33 " 35	.....	33 " 35
Florida Pebble Phosphate	.....	.....	.....	26 " 32	.....	26 " 32
Florida Acid Phosphate	.....	.....	.....	14 " 19	13 to 16	1 " 3
Tennessee Phosphate	.....	.....	....	34 " 39	.....	34 " 39
Tennessee Acid Phosphate	.....	.....	.....	14 " 19	13 to 16	1 " 3
Bone-Black (spent)	.....	.....	.....	32 " 35	.....	32 " 35
Bone Black (dissolved)	.....	.....	.....	17 " 19	16 to 17	1 " 2
Bone-Meal	2½ to 4½	3 to 5½	.....	20 " 25	5 " 8	15 " 17
Bone (dissolved)	2 " 3	2½ " 3½	.....	15 " 17	13 " 15	2 " 3
Peruvian Guano	6 " 10	7¼ " 12	1½ to 4	10 " 15	8	2 " 7

Composition of Fertilizer Materials Used as Sources of Potash.

	Pure Potash (K_2O.) Per Ct.	Lime Per Ct.	Nitrogen Per Ct.	Ammonia Per Ct	Phosp'ric Acid, Total, Per Cent.	Chlorine Per Cent.
Muriate of Potash....	50	.....	.....	.....	... .	45 to 48
Sulphate of Potash (high grade).....	50to55	.....	.....	.....	.....	0.3 " 1.5
Sulphate of Potash Magnesia.....	27 "30	0 85	.....	... .	....	1.5 " 2.5
Carbonate of Potash Magnesia.....	18½	.....	.....	.....	.....	.....
Kainit.....	12½	1.12	.....	.....	.....	30 " 32
Manure Salt	20	.....	.....	.....	.....	40 " 45
Cotton - Seed - Hull Ashes.....	20 "30	10	.....	.....	7 to 8	.....
Nitrate of Potash or Saltpeter.....	43 "45	.....	13to14	16 to 17	.....	.....
Wood - Ashes (unleached).....	2 "8	30to55	.....	.....	1 to 2	.....
Wood-Ashes (leached)	1 "2	35 "40	.....	.....	1 to 1½	.....
Tobacco Stems	5 "8	3.5	2 to 3	2½ to 3½	... ..	.....

Average Composition of the Most Important Farm Manures.

FARM MANURES.	Nitrogen Per Ct.	Equivalent in Ammonia Per Ct.	Potash (K_2O) Per Ct.	Phosphoric Acid Total Per Ct.	Lime (CaO) Per Ct.
Cow-Manure (fresh)..	0.34	0.41	0.40	0.16	0.31
Horse-Manure (fresh)..	0.58	0.70	0.53	0.28	0.21
Sheep-Manure (fresh) .	0.83	1.00	0 67	0.23	0.33
Hog-Manure (fresh). ..	0.45	0.54	0.60	0..9	0.08
Hen-Dung (fresh).....	1.63	1.98	0.85	1.54	0 24
Mixed Stable Manure..	0.50	0.60	0.63	0.26	0.70