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Summary of Fertilizer Use and Estimated Use of Plant Nutrients on Tobacco, Corn, Hay and Pastures in Kentucky

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SUMMARY OF FERTILIZER USE[1/] AND ESTIMATED USE OF PLANT NUTRIENTS ON TOBACCO, CORN, HAY AND PASTURES IN KENTUCKY
Jan. 1 - June 30, 1969

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Nearly 650,000 tons of fertilizer were used by Kentucky farmers during the first half of 1969. Plant food content ($N+P_2O_5+K_2O$) was 38%, or nearly 247,000 tons. Slightly over half (58%) was sold in bagged, one-third (33%) in bulk, and 8% in fluid form. Mixtures made up 70% of the total tonnage, and materials made up 30%. The statistics tabulated below show a more detailed breakdown of the fertilizer tonnage used.

ALL FERTILIZERS

Total tons fertilizers used	648,630
Total tons plant food used	246,609
Average plant food content (%)	38.0
Average analysis ($N-P_2O_5-K_2O$, %)	12.7-11.8-13.5
Form in which sold (%)	
Bagged	58
Bulk	33
Fluid	8

MIXED FERTILIZERS

Total tons mixtures used	454,579
Total tons plant food in mixtures	165,669
Average plant food content (%)	35.6
Average analysis ($N-P_2O_5-K_2O$ %)	6.9-14.0-14.7

Form in which sold:

Form	Tons	Percent of All Mixtures	Percent of All Fertilizers
Bagged	307,040	67.5	47.3
Bulk	135,604	29.8	20.9
Fluid	11,935	2.6	1.8
Mixtures as percent of all fertilizers			70

[1/] Data from "Distribution of Fertilizer Sales in Kentucky," January 1 through June 30, 1969. Div. of Regulatory Services, Ky. Agr. Exp. Sta., University of Kentucky, Lexington.

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FERTILIZER MATERIALS

Total tons materials used	194,051
Total tons plant food in materials	80,941
Average plant food content (%)	43.4
Average analysis ($N-P_2O_5-K_2O$, %)	26.8-6.2-10.4

Form and type sold:

Form	Tons Material by Type				Total	Percent of all:	
	Nitrogenous	Phosphatic	Potassic	Misc.		Materials	Fertilizer
Bulk	30,842	17,801	23,384	4,303	76,330	39.3	11.8
Bagged	46,005	11,859	9,848	1,670	69,382	35.8	10.7
Fluid	48,279	---	---	60	48,339	24.9	7.5

Materials as percent of all fertilizers 30

Estimated[2/] Fertilizer Use on Tobacco

Tobacco (all types) received 190,600 tons, or 30% of the total 648,630 tons of fertilizer used. This represented 60,950 tons, or 25% of the total 246,610 tons of plant nutrients ($N+P_2O_5+K_2O$) used. For the 173,067[3/] acres of tobacco (all types) grown, this amounted to an average use of 2,203 pounds fertilizer or 211-182-311 pounds $N-P_2O_5-K_2O$ per acre. There were 18,260, 15,760, and 26,940 tons of N, P_2O_5, and K_2O, respectively, used on tobacco.

Estimated[2/] Fertilizer Use on Corn

The 1,040,000[3/] acres of corn grown for grain received 212,390 tons, or 33% of the total 648,630 tons of fertilizer used. This represented 89,300 tons, or 36% of the total 246,610 tons of plant nutrients ($N+P_2O_5+K_2O$) used. Of the 89,300 tons plant nutrients, there were 40,975, 26,680 and 21,645 tons $N-P_2O_5-K_2O$ used, respectively. Average use per acre was 408 pounds fertilizer or 79-51-42 pounds $N-P_2O_5-K_2O$, respectively.

Estimated[2/] Fertilizer Use on Hay and Pastures

An estimated 20%, or 48,070 tons, of the total 246,610 tons of plant nutrients ($N+P_2O_5+K_2O$) was applied to hay and pasture crops. This represented 107,000 tons or 17% of the 648,630 total tons of fertilizer used. Of the 48,070 tons plant food, 7,920, 17,865, and 22,285 tons were N, P_2O_5, and K_2O, respectively.

[2/] Estimates were made on the basis of the stated assumptions.

[3/] From Ky. Crop and Livestock Reporting Service data.

Assumptions Used as Basis for Estimates

Tobacco

All tonnages of the following grades were assumed to have been used on tobacco: 5-10-15, 6-12-18, 4-16-4, 4-12-24, 5-20-30, 6-6-18, 8-12-15, 9-10-15, 10-10-15, 10-10-20, 8-10-15, 8-8-18, 0-0-22, 0-0-50, 0-15-0, 16-0-0. In addition, 40% of the 33-0-0 tonnage was assumed to have been used on tobacco.

Corn

All tonnages of the following grades were assumed to have been used on corn: 18-46-0, 21-53-0, 82-0-0. In addition, the following grades in proportions indicated were assumed to have been used on corn: 50% of 10-10-10, 12-12-12, 14-14-14, 15-15-15, 16-16-16, 4-12-8, 5-15-10, 6-18-12, 10-30-20, 3-9-6; 70% of 5-20-20, 6-24-24, 3-12-12, 21-0-0, 30-0-0; 90% of 5-10-10, 6-12-12, 10-20-20, 8-16-16; 30% of 33-0-0.

Hay and Pasture

All tonnages of the following grades were assumed to have been used on hay and pastures: 0-20-0, 0-25-25, 0-30-30, 0-9-27, 0-10-30, 0-15-30, 0-10-20, 0-0-60, 0-20-0, 0-46-0. In addition, the following grades in the proportions indicated were assumed to have been used on hay and pastures: 20% of 33-0-0; 30% of 5-20-20, 6-24-24, 3-12-12, 21-0-0, 30-0-0.

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Increased Nitrogen Use Creates Additional Need for Lime

The overriding factor which limits total crop production in Kentucky is acid soils. Most crops grown in the state do not use applied fertilizer as efficiently under acid conditions as they do at near-neutral conditions. As a general statement this means soils should be limed to a pH of 6.0 to 7.0, dependent on the particular crop to be grown.

Increased fertilizer use has been a major factor in raising crop production levels to those obtained in Kentucky today. However, this increased use creates a need for lime above and beyond that which is needed to neutralize the acidity which is generated under natural soil conditions. This is because most of the nitrogen sources used in fertilizer generate acidity when applied to soil.

For example, it would take about 150,000 tons of completely reactive limestone with a 90% calcium carbonate equivalent just to neutralize the acid generated by the approximately 80,000 tons of nitrogen used in Kentucky during the first half of 1969. This is about 2 pounds of lime for every 1 pound of nitrogen applied. With the trend to use of higher rates of nitrogen, this means that more lime is needed just to maintain the soil pH level.

What this means is that in order to produce higher crop yields through application of higher rates of nitrogen, the use of additional lime is required. While many of the better producers in the state have made this adjustment in their crop production systems, many have not. This is evidenced by the decrease from nearly 2.2 million tons agricultural limestone sold in Kentucky during 1966 to the slightly over 1.9 million tons sold in 1968. Contrast this to the estimated need of about 4.5 million tons per year.

Most of the lime used is bought through the cost-sharing programs of county ACP offices (1.2 million tons of the 1.9 million tons used in 1968 was cost-shared). Lime use on acid soils as the basis of crop production is an economic investment which will pay off in higher yields as the result of more efficient use of applied fertilizer. Insufficient ACP funds to cost-share for all the lime needed should not limit the amount of lime used. If average crop yields on acid soils in Kentucky are to be increased, the use of more lime is a basic must.