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FERTILIZER Situation

JAN 20 1974

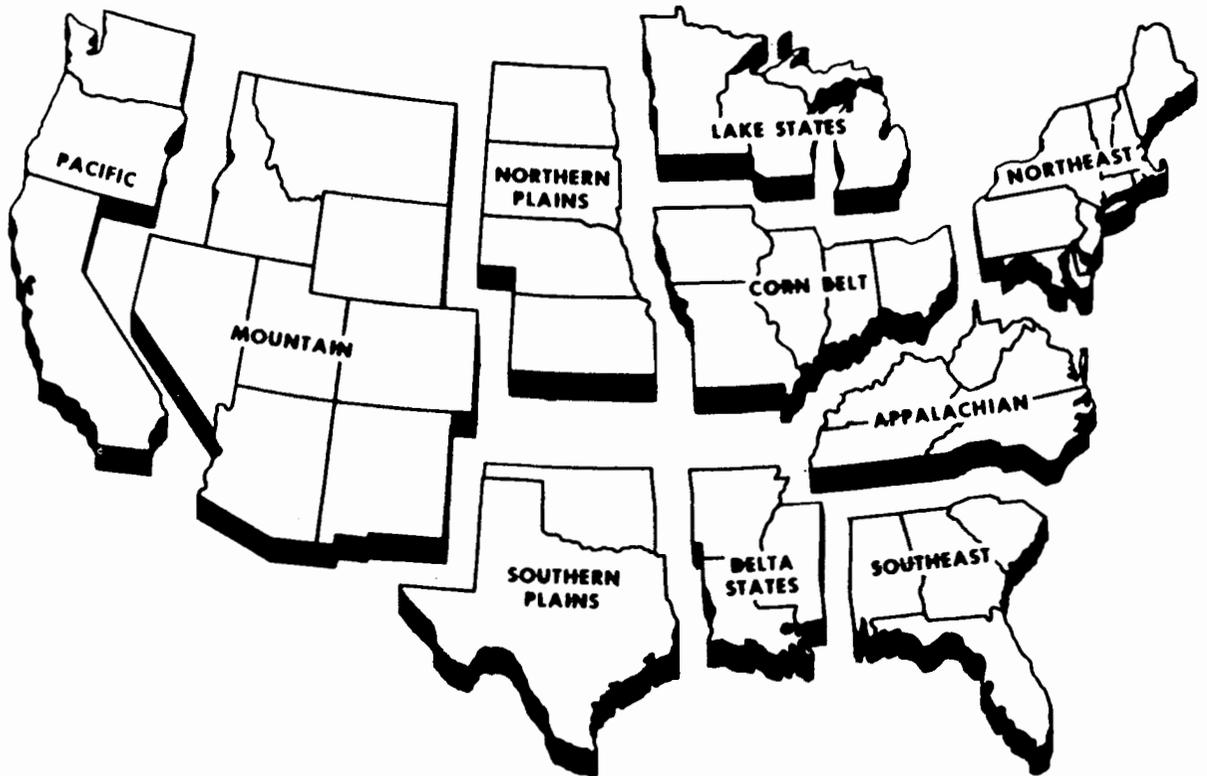


This report was prepared before the January 22, 1974, release by Statistical Reporting Service of "Prospective Plantings—January 1, 1974". Following the report of planting intentions, the fertilizer outlook will be reassessed and a supplement to this "Fertilizer Situation" will be issued if conditions warrant.

Conversion Factors

To convert	To	Multiply by
P ₂ O ₅	P	0.43642
P	P ₂ O ₅	2.29137
K ₂ O	K	.83016
K	K ₂ O	1.20459
Anhydrous ammonia	N	.82
Urea	N	.46
Ammonium nitrate	N	.335
Ammonium sulfate	N	.205
Sodium nitrate	N	.16
Superphosphate:		
20 percent P ₂ O ₅	P	.08728
46 percent P ₂ O ₅	P	.20075
Potash:		
60 percent K ₂ O	K	.49810
62 percent K ₂ O	K	.51470
Potassium chloride	K ₂ O	.63177
Metric tons (tonnes, 2204.6 av. lbs.)	Short tons	1.10231
Long tons (2240 av. lbs.)	Short tons	1.12

FARM PRODUCTION REGIONS



U.S. DEPARTMENT OF AGRICULTURE

NEG. ERS 1399A-62 (8) ECONOMIC RESEARCH SERVICE

FERTILIZER SITUATION

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Approved by
The Outlook and Situation Board
and Summary released
January 16, 1974

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The *Fertilizer Situation* is published annually.

SUMMARY

Demand for nitrogen and phosphate fertilizers has placed intensive pressures on supplies for 1974. Prices have skyrocketed since fertilizers were freed from Phase IV price regulations on October 25. Early indications are that prices of fertilizers with a high nitrogen content may be up 50 percent this spring from a year earlier. Phosphates may be up 40 percent. Prospective potash price increases are in the area of 20 percent, although North American potash production capabilities are far in excess of current demand.

The 1974 fertilizer bill for farmers in the United States may go to \$4 billion, nearly 40 percent above 1973. A ton of fertilizer will cost over \$100 this year compared with \$78 estimated for 1973.

Perhaps 8 percent more nitrogen and phosphates will be available in 1974, but demand at current prices probably will not be satisfied. Potash use may be up 5 percent.

Natural gas, essential to ammonia (nitrogen) production, is short. The shortage is keeping needed new plants from being built and some existing plants from operating at capacity. Thus, imports of nitrogen fertilizer probably will increase.

By the end of 1974, ammonia production capacity will be up 2 percent to about 17.25 million tons as one new plant is scheduled to come onstream late in the year. Also at that time, five new phosphoric acid plants with a total annual capacity in excess of 1 million tons P₂O₅ are expected to come onstream, ending a 2-year phosphoric acid drought.

Fertilizer prices in 1973 were stable at wholesale levels as prices were controlled until October 25. Then they were freed from further regulations and prices advanced sharply across the board. Retail prices were not effectively controlled because of major exceptions to price regulation at the farm level. From April to September, retail prices rose 12 percent. With complete decontrol, retail prices jumped as much as 40 percent higher almost overnight. With decontrol, a sizable contingent of fertilizer manufacturers promised to make an additional 1.5 million tons of five fertilizer products available to farmers from then through June 1974.

Three percent more fertilizer was used in the 12 months ended June 30, 1973, than during the

previous 12-month period. Total use was 42.5 million tons. About 36.1 million tons of this was for farm use. Plant nutrient use was: nitrogen, 8.3 million tons; phosphate (P₂O₅), 5.1 million tons; and potash (K₂O), 4.4 million tons. Nitrogen and P₂O₅ use both were up 4 percent. K₂O use rose 2 percent.

The shift to use of separate materials has stalled. For the third straight year, the proportion of separate materials averaged 48 percent of total consumption. Also, the use of liquid fertilizers declined for the first time in recent years.

In 1973, the use of fertilizer on corn averaged slightly lower per acre than in 1972. The same was true for cotton. However, average use on wheat and soybeans generally increased. Poor planting weather and tight fertilizer supplies probably were responsible for the declines on corn and cotton.

Fertilizer exports were \$468 million in the 1972/73 fiscal year. This was 38 percent more than during the preceding 12 months. Exports financed by the United States Agency for International Development at \$93 million were nearly double those of 1971/72. Some of the fertilizer purchases financed by AID were from offshore producers.

OUTLOOK FOR 1974

Overview

Prices of fertilizers and fertilizer materials were exempted from Phase IV price stabilization regulations on October 25, 1973. Decontrol was most significant at manufacturer and wholesale levels. Although well over half of all fertilizer sales at retail had not been subject to strict price controls, prices were generally held in check by competitive forces from within the segment of the industry that was controlled.

Domestic fertilizer prices at the producer level were first frozen August 15, 1971, near the bottom of a long price decline which had been brought on by capacity in excess of demand. As a consequence, manufacturers had, according to the Cost of Living Council, "insufficient cost justification to implement price increases under Economic Stabilization Program regulations." This resulted in a widening gap between domestic and world prices. The world prices became so much higher that fertilizers essential to peak crop production in the United States were sold abroad at an increasing rate. To reverse this trend, fertilizer prices were exempted from control. In concert with this move, nearly 40 fertilizer producers agreed to make an additional 1.5 million tons of ammonia, urea, ammonium sulfate, diammonium phosphate, and concentrated superphosphate available to U.S. farmers from October 1973 through June 1974.

With decontrol came sharp price increases.

The United States was a net importer of urea and some other nitrogen fertilizers. However, due to greatly increased exports of ammonia and ammonium phosphates, the United States remained a net exporter of nitrogen by nearly two to one.

Export tonnage of phosphate fertilizers rose 4 percent while value increased 38 percent. Brazil continued to be one of our principal export markets. Phosphate rock exports were about the same as a year earlier, with Canadian buyers taking nearly a fourth.

Canada supplied 3 million tons—96 percent—of the U.S. imports of potash. This was equivalent to 69 percent of U.S. use. The Saskatchewan potash price floor was unchanged at 33.75 cents per unit of K₂O.

The outlook for 1974 in world markets is a tight nitrogen supply and continued strong demand. No let-up in demand for phosphate fertilizer can be foreseen for the first half of 1974. World capacity to produce P₂O₅ is expected to increase 12 percent by the latter part of the year. This will provide relief for a tight supply situation. No problems are anticipated in the world markets for potash. Canadian producers have ample production capacity to supply any presently foreseeable demand.

Although use rose only 3 percent in 1972/73, farmers spent an estimated \$2.8 to \$3 billion for fertilizer in calendar 1973—up 12 percent or more over 1972's expenditures of about \$2.5 billion. If price levels of November 1973 remain firm or move somewhat higher in the months ahead, expenditures for fertilizer used in 1974 may approach \$4 billion—a towering 38 percent boost in one year.

If these estimates prove to be close to the mark for 1973 and 1974, the average farm cost of a ton of fertilizer will have risen from about \$71 in 1972 to \$78 in 1973 and to over \$100 in 1974. Still 1974 farm use of fertilizer may be up about 8 percent—given adequate supplies.

Nitrogen Fertilizers

Prices

Prices of fertilizers containing appreciable percentages of nitrogen in 1974 may be up as much as 50 percent over 1973. The quantity of nitrogen demanded will exceed the available supply at current prices as prices of crops that respond well to nitrogen—corn, cotton, small grains—are at levels that will encourage farmers to push for peak output by planting more acres and by applying nitrogen heavily.

Because of urea's high nitrogen content and dual use both as a fertilizer and as a feed protein substitute, demand may push urea prices to record

levels. The previous high paid by farmers for urea was \$123 a ton in 1959, the first year that urea prices were surveyed by USDA. The price may average over \$130 in 1974. Ammonium nitrate, ammonium sulfate, and sodium nitrate prices as well as prices for mixed fertilizers made primarily with nitrogen materials may be at their highest levels of record.

Production Capacity

Anhydrous ammonia production capacity will change slightly from the rated 17 million tons for 1973. An ammonia plant scheduled for completion in the last quarter of 1974 will boost rated output 340,000 tons a year. This will more than offset the net loss of 89,000 tons of capacity in 1973 when losses in production capacity exceeded gains.

Further gains in capacity can be expected if old, dismantled plants are reactivated or rebuilt as trade sources indicate they might be. However, such gains will be more of a factor in the years beyond 1974. Accordingly, 1974 will start with capacity just below 17 million tons, but by year's end capacity should be 17.25 million tons, a 2 percent increase. This means that theoretically, nitrogen capacity will be about 14 million tons for the 12 months. Roughly three-fourths of this—10.5 million tons—will be earmarked for agriculture and export as fertilizers. Another 125,000 tons of nitrogen are provided by the coking of coal for steel production.

An additional factor in the output of nitrogen fertilizers is the possibility that curtailment of deliveries of natural gas during the cold months of the year might reduce output by half million tons or more of nitrogen. Only the severity of the winter can determine the final result. Curtailments occur during the winter period when gas is used and during the summer when gas is routed to storage. Early estimates by the American Gas Association indicate a 40 percent increase in curtailments during the year April 1973 to March 1974 compared with the like period of 1972/73. If this reduction is correlated directly to ammonia output, the estimated loss will be equivalent to nearly 2 percent of rated production capacity. Since these data are based on surveys of less than 100 percent of the ammonia producers and gas pipeline companies, the final results may be somewhat different.

About 600 billion cubic feet of natural gas are required to produce 17 million tons of ammonia. The availability of natural gas limits this Nation's potential to produce ammonia. Few industry observers see the domestic production of natural gas being equal to the demand, now or in the future. If this is the case, the United States will have to look to imports for an increasing share of nitrogen requirements. Only since 1965/66 has the United States been a net exporter of nitrogen. Before that time we were usually net importers, mainly because

of the importance of Chilean sodium nitrate and calcium cyanamide from Canada as nitrogen fertilizers. In recent years, Chile's imports of sodium nitrate have fallen to about 15,000 tons of contained nitrogen and the calcium cyanamide plant in Canada has been closed.

Use

A prospective sizable increase in planted acreage plus the likelihood of continued strong demand for farm output at relatively high prices in 1974 are precursors of an increase in use of nitrogen fertilizers. How much more will be used in 1974 depends mostly upon how much will be available for use in the United States. Almost certainly, what is offered will be bought.

Because of the sheer size of the job of transporting fertilizers from the producing plants to the farm (some 27 million tons of fertilizer may be used on farms this spring) spot shortages will occur and in some instances they will be severe.

Phosphate Fertilizers

Prices

The outlook for phosphate fertilizer prices is much like that for nitrogen—record prices are indicated for 1974. Demand both in United States and abroad for high analysis phosphates will continue strong. Domestic farm prices for both concentrated superphosphate and diammonium phosphate in the early part of 1974 may rise 40 percent or more above those during the first half of 1973. This means that prices of complete mixed fertilizers also will rise a corresponding amount. However, toward the end of 1974 some of the buoyancy may dissipate and phosphate prices could level off.

Production Capacity

Wet-process phosphoric acid is the basic material for producing most high analysis phosphate fertilizers. Acid capacity was about 6.5 million tons P₂O₅ at the beginning of 1974. Public announcements indicate that just over a million tons P₂O₅ production capacity is scheduled to come onstream by the end of 1974. Five plants, either additions to existing facilities or new ones, are included. Some of these plants will probably experience construction delays but these are not apt to be lengthy. The shortfall in P₂O₅ output capacity will likely be eliminated by the start of 1975.

Problems may be encountered in the production of phosphate rock during 1974. Phosphate rock producers use about 10 percent of the electric power sold in Florida. As a consequence, production may be slowed in the hot summer months when demand for power can exceed generating capacity.

Use

Demand for phosphates will continue strong throughout 1974. Grains and pastures both require phosphorus for good growth and high yields. Also, more acres may be planted to grains in 1974 and farmers are likely to boost use per acre as long as crop prices remain at high levels. If supplies of phosphates are available, domestic use may be up 8 percent or more in 1974. An increase of this magnitude—some 400,000 tons P₂O₅—will push the production of sulfur and phosphate rock as well as finished products to the limit.

Dicalcium Phosphate

Repercussions of the short supply of phosphoric acid will be felt in the animal feed industry. Estimated demand for dicalcium phosphate as a feed supplement is about 1.6 million tons dicalcium equivalent for 1974. Made from phosphoric acid and limestone, production of this material will be about 1.3 million tons. The shortage traces back to the short supply of phosphoric acid. Producers of dicalcium phosphate—there were 11 plants reported in 1972 in the United States—believe supplies of phosphoric acid will be ample for their needs by the end of the first quarter of 1975.

Phosphate Rock

Demand (domestic plus net exports) for phosphate rock will exceed domestic production in 1974. As a consequence, prices will remain firm and move higher where contracts will permit price escalation.

Phosphate rock producers face production difficulties that, in a few instances, may be hard to surmount. The mines have been running at capacity for some time and breakdowns are becoming more probable. Although output is expanding in Florida and North Carolina, new mine development is retarded as mining permits become more difficult to obtain. Also, difficulties are experienced in obtaining rezoning from agricultural use to mining where new deposits could be opened. Power failures, labor shortages, and restrictions on water use also will plague producers.

To supply new phosphoric acid facilities coming onstream in the United States, rock exports will probably be reduced. Foreign buyers of U.S. phosphate rock almost certainly will get less than 100 percent of what their contracts call for. A more likely figure is somewhere between 80 and 90 percent.

Phosphate rock prices are likely to advance during the year. Effective January 1, 1974, Moroccan phosphate rock, 75 percent bone phosphate of lime (BPL), will be priced \$42 a metric ton f.a.s. This is a three-fold increase from the \$14 charged before January 1. At the same time, U.S. prices for exported rock will go from \$13.00 to \$27.50 for a long ton, f.a.s.

75 percent BPL rock. It is entirely possible that these moves will pull domestic prices of phosphate rock considerably above current levels.

Sulfur

Sulfur supplies generally are adequate to meet demand in 1974. Production of sulfur (Frasch plus recovered) will most likely be in balance with demand without reducing stocks on hand. For this reason, there's no real pressure to raise prices. Perhaps some price increases will be tested by producers. At the end of 1973, the f.o.b. Tampa, Florida, price was about \$30 a ton. A major deterrent to any sizable increase in sulfur prices is a huge 10 or 11 million ton inventory of byproduct sulfur from Alberta, Canada, gas wells. If prices in the United States rise sharply, imports from Mexico as well as Canada are certain to increase.

Potash Fertilizers

The price of 33.75 cents per 20 pound unit of K₂O is the legal minimum price for potash produced in Saskatchewan as 1974 gets underway. This price acts as a floor price in world markets. However, actual prices will be considerably above the minimum. At the producer's level, potash prices are more likely to range upward from 41 cents or more per unit for standard grade material during the spring rush season. Prices to farmers may be up 20 percent or so. The size of this increase is considerably below that anticipated for phosphates or nitrogen fertilizers.

Production Capacity

U.S. and Canadian capacity to produce potash is considerably in excess of demand. But, because of the estimated 3 to 5 year lead time to sink a mine shaft and build a refinery, it is likely that firms either are considering enlarging their production capacity or they are analyzing the possibility of sinking a new shaft in a potash deposit.

U.S. capacity to produce potash is declining as the average ore quality deteriorates from year to year. Output of Canadian potash, on the other hand, is in the ascendency. As a result, U.S. farmers are becoming more dependent upon potash imported from Canada.

At the beginning of 1974, there were 10 producing mines in Saskatchewan.¹ Their combined rated annual capacity is 8.3 million tons K₂O. As of November 1, 1973, production allowable for the year ending June 30, 1974, was set at 5.7 million tons. This figure includes 5.3 million tons to meet market demand and 400,000 tons for inventory buildup. These data indicate that the Canadian producers will

¹Data about potash capacity and production in Saskatchewan supplied by Department of Mineral Resources, Province of Saskatchewan.

operate at slightly more than 68 percent of rated capacity the first half of 1974.

Potash producers pay Saskatchewan Province a pro-ration fee of \$1.20 per ton of potash produced. This rate was effective October 1, 1973, and compared with the old fee of 60 cents.

Use

Expanded acreages of most grains with the possible exception of soybeans are the prospect for 1974. Accordingly, the use of potash is likely to rise. An increase of 5 percent would be in order if transportation difficulties can be held to a minimum. With only one exception, the principal potash deposits in both the United States and Canada depend primarily on rail transportation. In the peak shipping period, logistics problems can cause delays in shipping that translate to shortages at the destination. Also, spot short supplies of a particular type of potash—soluble, for example—are almost sure to happen.

Fertilizer Prices—1973

Beginning June 13, 1973, with a 60 day freeze, fertilizer prices were subject to Phase IV price stabilization regulations until October 25. On that date, fertilizer prices at all levels were freed from regulation. During Phase IV and earlier price regulation phases, fertilizer prices at both the producer and retailer levels had been moving higher but the pace was sluggish.

Prices were controlled in domestic markets but exported materials were not subject to price regulation. Prior to and during this period, demand for U.S. produced fertilizers grew at a fast rate at the

same time that the dollar weakened considerably in so-called "strong" currency countries. The result was the growth of a two-price system, with one price level for fertilizers sold in the United States and another, considerably higher, for world trade. With this sort of situation, only one thing could happen—and it did. Export prices became high enough to siphon much needed nitrogen and phosphate fertilizers out of the United States. With the end of government control, U.S. prices immediately shot up 45 to 65 percent from the producer's level to world trade price levels then prevailing. This action meant that American farmers could compete on equal terms for limited fertilizer supplies at higher prices.

Nitrogen Fertilizer Prices

From April 15, 1972, to April 15, 1973, the average farm price of ammonia increased 10 percent, from \$80 a ton to \$87.60 a ton (table 1). In the next 6 months, it was up another 5 percentage points. However, by December 10, 6 weeks later, the retail price of ammonia had zoomed to \$153 a ton. Not since the fall of 1956 has the domestic farm price of ammonia been as high. This increase is indicative of a similar movement at the manufacturer's level. At the time of government decontrol, ammonia was quoted at \$62.50 a ton delivered east of the Rocky Mountains except the East Coast. By mid-December, the price was about double—within a range of \$95 to \$125 a ton (fig. 2).

Most fertilizers with a high nitrogen content were affected similarly. Both urea and ammonium nitrate were up nearly 90 percent from April 15, 1972, to December 15, 1973, on a contained nitrogen basis (table 2). The lowest cost nitrogen, that contained in

Table 1.—Average prices paid by farmers per ton for selected fertilizers, United States, 1957-59 average, and 1968-73

April 15 of year	Anhydrous ammonia	Superphosphate		Ammonium phosphate 16-20-0	Potash 60 percent K ₂ O	Mixed fertilizer 6-24-24
		46 percent P ₂ O ₅	20 percent P ₂ O ₅			
	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars
Annual average						
1957-59	149.00	82.20	37.00	89.60	¹ 56.80	--
1968	91.40	78.40	43.20	78.40	49.10	81.80
1969	75.60	74.00	43.80	77.70	47.80	73.20
1970	75.00	75.10	45.40	76.90	50.90	75.00
1971	79.30	76.60	47.80	76.70	58.20	80.30
1972	80.00	78.00	49.90	79.00	58.80	81.60
1973:						
Apr. 15	87.60	87.50	53.70	83.90	61.50	88.00
Sept. 15	92.50	94.10	56.00	88.60	63.60	90.80
Dec. 10	153.00	128.00	--	--	78.00	--

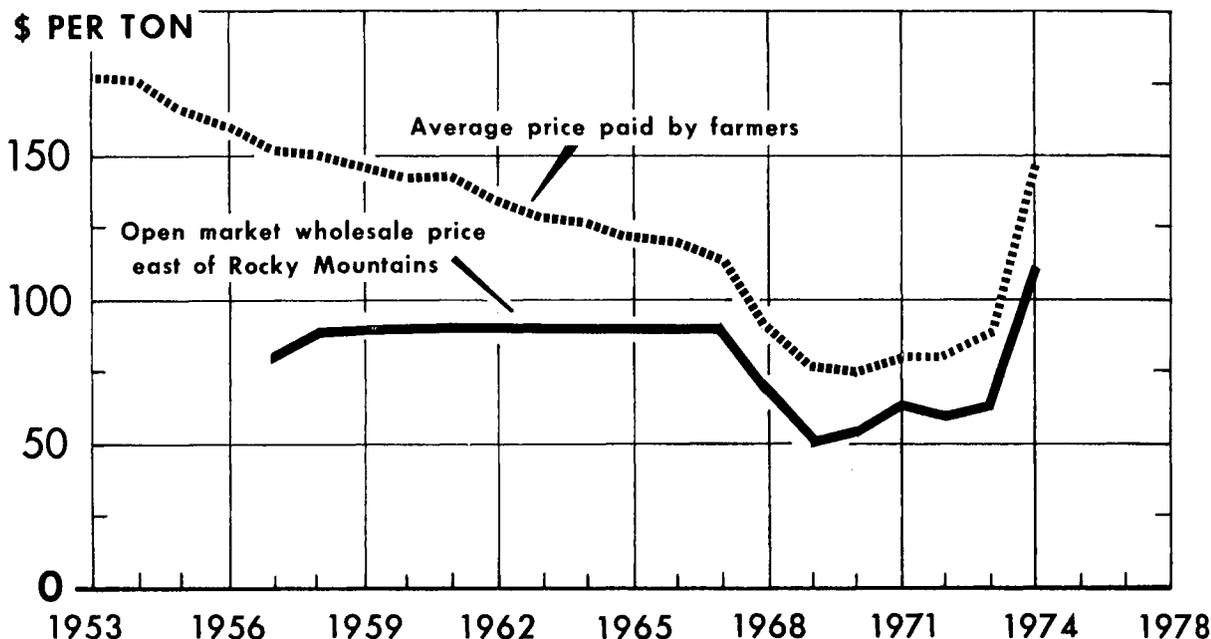
¹ Based on equivalent price for 55 percent K₂O reported by SRS.

Source: "Agricultural Prices", Pr 1 (9-73), Statis, Rptg, Serv., U.S. Dept. Agr., September 28, 1973, and earlier issues for all

prices except December 10. December 10 prices are unweighted averages from a special Agricultural Stabilization and Conservation Service survey.

-- Not available.

ANHYDROUS AMMONIA PRICES APRIL 15, 1953-74



OIL, PAINT AND DRUG REPORTER, F.O.B. WORKS, "FREIGHT EQUALIZED" UNTIL SEPT. 1969 AND THEN "DELIVERED" EXCEPT EAST COAST. 1974 ESTIMATED.

U.S. DEPARTMENT OF AGRICULTURE

NEG. ERS 8178-74 (1) ECONOMIC RESEARCH SERVICE

Figure 2

ammonia, had a farm price of 9.35 cents a pound. The highest price—25.5 cents a pound—was for the nitrogen in sodium nitrate.

Phosphate Fertilizer Prices

Phosphate prices also were sharply higher by the end of 1973. From April 1972 to April 1973, concentrated superphosphate was up 12 percent to farmers. By September, the price had gone to \$94.10 a ton, an additional 8-percent rise in 6 months. Within 60 days—December 10—the price was \$128 a ton, up 36 percent more. The higher price meant that farmers paid \$6.36 per 20 pound unit of phosphorus contained in concentrated superphosphate—the highest price on record since the U.S. Department of Agriculture first reported concentrated superphosphate prices in 1949 (table 3).

Potash Fertilizer Prices

Potash prices also reached record heights except for those paid during World War I. As of December 10,

the farm price for potash was about \$78 a ton. This price, equivalent to \$1.56 per 20 pound unit of potassium (table 3), was 22 percent above the September price. Potash prices increased at a slower rate than did nitrogen and phosphate prices, a consequence of having capacity in excess of demand.

Fertilizer Use Estimates—1972/73

Fertilizer use in the United States was a record 42.5 million tons in the year ended June 30, 1973, up from 41.2 million tons the year before (table 4). About 85 percent of the total tonnage, or 36.2 million tons went to agriculture, the remainder was used for nonfarm purposes.

Early estimates indicate that 312.2 million acres for "principal" crops were harvested in 1973. Accordingly, farmers used an average of 97 pounds of N-P₂O₅-K₂O per harvested acre. In the year before, farm use of these nutrients on the same crops averaged 103 pounds an acre. This 6 percent decline in nutrient use per acre is an indication of the tight

Table 2.—Average prices paid by farmers per 20-pound unit of nitrogen contained in nitrogenous materials, United States, 1963-73¹

April 15 of year	Nitrate of soda	Sulfate of ammonia	Ammonium nitrate	Urea	Anhydrous ammonia	Nitrogen solutions percent N		
						28	30	32
	<i>Dollars</i>	<i>Dollars</i>	<i>Dollars</i>	<i>Dollars</i>	<i>Dollars</i>	<i>Dollars</i>	<i>Dollars</i>	<i>Dollars</i>
1963	3.75	2.55	2.42	2.35	1.56	--	--	--
1964	3.76	2.57	2.38	2.33	1.54	--	--	--
1965	3.76	2.60	2.35	2.29	1.49	--	--	--
1966	3.73	2.58	2.28	2.22	1.45	--	--	--
1967	3.76	2.64	2.21	2.18	1.38	--	--	--
1968	3.74	2.63	2.03	2.02	1.11	1.95	2.09	2.06
1969	3.74	2.56	1.84	1.84	.92	1.49	1.79	1.80
1970	3.89	2.56	1.79	1.82	.91	1.64	1.81	1.83
1971	4.07	2.52	1.89	1.80	.97	1.79	1.87	1.90
1972:								
Apr. 15	4.13	2.54	1.93	1.79	.98	1.85	1.84	1.96
Sept. 15	4.36	2.59	1.95	1.82	.99	1.86	1.86	1.98
1973:								
Apr. 15	4.84	2.69	2.13	1.98	1.07	2.05	1.94	2.09
Sept. 15	5.11	2.90	2.31	2.11	1.13	2.18	2.03	2.25
Dec. 10	--	--	3.62	3.39	1.87	--	--	--

¹ Excludes Alaska and Hawaii.

-- Not available.

Source: Computed from "Agricultural Prices", Pr 1 (9-73),

earlier issues for all prices except December 10. December 10 prices are unweighted averages from a special Agricultural Stabilization and Conservation Service survey.

Statis, Rptg. Serv., U.S. Dept. Agr., September 28, 1973, and

fertilizer supply situation in 1973 and unfavorable weather conditions.

Table 3.—Average prices paid by farmers per 20-pound unit of phosphorus contained in phosphate materials and potassium in muriate of potash, United States, 1963-73¹

April 15 of year	Superphosphate		Muriate of potash ⁴
	Normal ²	Concentrated ³	
	<i>Dollars</i>	<i>Dollars</i>	<i>Dollars</i>
1963	4.64	4.04	1.18
1964	4.62	3.99	1.18
1965	4.66	4.03	1.17
1966	4.74	4.12	1.20
1967	4.82	4.19	1.17
1968	4.95	3.90	.98
1969	5.02	3.69	.96
1970	5.20	3.74	1.02
1971	5.48	3.82	1.17
1972:			
Apr. 15	5.72	3.89	1.18
Sept. 15	5.87	3.94	1.18
1973:			
Apr. 15	6.15	4.36	1.23
Sept. 15	6.41	4.69	1.28
Dec. 10	--	6.36	1.56

¹ Excludes Hawaii and Alaska. ² 20 percent P₂O₅. ³ 46 percent P₂O₅; 45 percent P₂O₅ prior to 1967. ⁴ 60 percent K₂O; 55 percent K₂O prior to 1968.

--Not Available.

Source: Computed from "Agricultural Prices", Pr 1 (9-73), Statis, Rptg. Serv., U.S. Dept. Agr., September 28, 1973, and earlier issues for all prices except December 10. December 10 prices are unweighted averages from a special Agricultural Stabilization and Conservation Service survey.

Total plant nutrient use continued to grow in 1972/73. Use of each of the primary plant nutrients increased. Nitrogen and phosphate use was each up more than 4 percent. A year earlier, a slight decline was reported for both of these nutrients. The increase in potash use—up 1.9 percent—was close to the 2 percent increase reported a year earlier. The following tabulation shows the use of N-P2O5-K2O in the United States for the past 2 years:

Nutrient	1971/72	1972/73	Change
	1,000 tons	1,000 tons		Percent
Nitrogen	7,995	8,319	4.1
P ₂ O ₅	4,865	5,064	4.1
K ₂ O	4,316	4,397	2.0
Total	17,176	17,780	3.5

Shift to Separate Materials Slows

The trend toward increasing use of separate materials has nearly halted after moving upward at a fairly steady pace until 1971 when 48 percent of all fertilizer was applied as a separate material (table 5). This proportion has not changed significantly for 3 years. It is likely that the trend away from mixtures will continue but at a slower rate as farmers become aware of the efficiencies associated with the use of liquid and dry separate materials.

Use of Liquids Slows

For the first time in recent years, the use of liquid fertilizers failed to show an annual increase. Some

Table 4.—All fertilizer: Total use and primary nutrient use, United States, 1960-73¹

Year ending June 30	Total use	Primary nutrient use				
		N	Available P ₂ O ₅	K ₂ O	Total	Index
	1,000 tons	1,000 tons	1,000 tons	1,000 tons	1,000 tons	1967=100
1960	24,887	2,738.0	2,572.4	2,153.3	7,463.7	53.4
1961	25,567	3,030.8	2,645.1	2,168.5	7,844.4	56.1
1962	26,615	3,370.0	2,807.0	2,270.5	8,447.5	60.5
1963	28,844	3,929.1	3,072.9	2,503.4	9,505.4	68.0
1964	30,681	4,352.8	3,377.8	2,729.7	10,460.3	74.9
1965	31,836	4,638.5	3,512.2	2,834.5	10,985.3	78.6
1966	34,532	5,326.3	3,897.1	3,221.2	12,444.7	89.1
1967	37,082	6,027.1	4,304.1	3,641.8	13,973.6	100.0
1968	38,743	6,787.6	4,453.3	3,792.6	15,033.5	107.6
1969	38,949	6,957.6	4,665.6	3,891.6	15,514.8	111.0
1970	39,591	7,459.2	4,573.9	4,035.7	16,068.8	115.0
1971	41,118	8,133.6	4,803.4	4,231.4	17,168.4	122.9
1972 ²	41,206	8,016.0	4,873.1	4,332.0	17,221.1	123.2
1973 ³	42,536	8,338.8	5,072.0	4,411.5	17,822.3	127.5

¹ Includes Puerto Rico. ² Revised. ³ Preliminary.

Source: Years 1960-69 from "Consumption of Commercial Fertilizers and Primary Plant Nutrients", Stat. Bull. 472, Statis.

Rptg. Serv., June 1971. Years 1970-73 from "Consumption of Commercial Fertilizers in the United States" SpCr 7 (10-73) Statis. Rptg. Serv., U.S. Dept. Agr., November 1973 and earlier issues.

Table 5.—All fertilizer: Mixtures and direct-application materials used, averages 1950-64, annual 1967-73, United States

Year ending June 30	All fertilizer	Mixtures		Materials ¹	
		Quantity	Percentage of total	Quantity	Percentage of total
	1,000 tons	1,000 tons	Percent	1,000 tons	Percent
Average:					
1950-54	21,313	14,293	67	7,020	33
1955-59	22,831	14,843	65	7,988	35
1960-64	27,062	16,347	60	10,715	40
1967	36,888	20,958	57	15,930	43
1968	38,557	21,126	55	17,431	45
1969	38,782	21,077	54	17,705	46
1970	39,434	20,819	53	18,615	47
1971	40,982	21,388	52	19,594	48
1972	41,059	21,398	52	19,661	48
1973 ²	42,396	21,951	52	20,445	48

¹ Primary nutrients plus secondary and micronutrient materials not included in commercial mixtures. ² Preliminary.

Source: "Consumption of Commercial Fertilizers in the United States, Year Ended June 30, 1973", SpCr 7 (10-73) Statis. Rptg. Serv., U.S. Dept. Agr., November 1, 1973, published annually.

10.8 million tons of liquids were used in 1971/72, accounting for 27 percent of all fertilizers used (table 6). During 1970/71, 11.1 million tons of liquids—28 percent of all fertilizers—were used. This reflects almost entirely a 300,000 ton decline in use of anhydrous ammonia from 1970/71 to 1971/72.

The shift to more dry bulk goods continued unabated to reach 44 percent of all fertilizer use in 1971/72.

Plant nutrient use was up in 1972/73 in most sections of the country. At the regional level, gains in the use of nitrogen were reported for 8 of the 10 regions (table 7). Increases over 10 percent were shown for the Northeast, the Plains States, and the Mountain States. However, declines in use of 2 percent in the Corn Belt and 7 percent in the Delta States held the net gain for the United States to 4 percent.

Table 6.—All fertilizers: Use by class, mixtures and direct application materials, selected years ^{1 2}

Year ending June 30	Dry bagged		Dry bulk		Liquid	
	1,000 tons	Percent	1,000 tons	Percent	1,000 tons	Percent
1954	--		--		565.4	3
1961	--		--		2,763.4	12
1963	--		--		4,089.2	15
1964	--		--		4,742.2	16
1965	--		--		5,352.3	18
1967	15,489.2	44	12,159.4	34	7,676.1	22
1968	13,900.1	38	14,313.4	39	8,426.6	23
1969	13,143.8	35	15,198.5	41	8,936.7	24
1970	12,146.3	32	15,822.4	42	9,977.2	26
1971	11,529.5	29	16,958.6	43	11,141.5	28
1972	11,246.0	29	17,513.1	44	10,839.7	27

¹ Alaska and Hawaii not included. ² Includes all commercial fertilizer sold or shipped for farm and nonfarm use as fertilizer. Secondary and micronutrient materials applied directly to the soil are not included. Anhydrous ammonia is included in "liquid".

Source: "Commercial Fertilizers, Consumption in the United States by Class (Dry Bagged, Dry Bulk, Liquid) Year ended June 30, 1972", SpCr 7 (73) Statis, Rptg. Serv., U.S. Dept. Agr., June 27, 1973, and earlier issues.

--Not available.

Phosphate use was up in 8 regions also. An increase of 18 percent was indicated for the Southeast, the greatest increase for any region. Use of phosphates dropped 1 percent in the Corn Belt and was unchanged in the Delta States. Despite rather sizable percentage increases in most regions, total U.S. use was held to a 4-percent rise.

The strongest rate of increase in use of any nutrient was a sharp 44 percent rise in K₂O applications in the Northern Plains. Partly offsetting were declines in K₂O use of 3 percent in the Corn Belt, 6 percent in the Delta States, and 10 percent in the Mountain States. The gains outweighed the losses, however, resulting in a net 2 percent increase.

The slowdown in fertilizer use in the Corn Belt and Delta States probably can be attributed to foul weather accompanied by damaging floods and a significant drop in acres of cotton in the Delta States. Some of the decline in use may have been made-up in

July and August of 1973/74 with delayed applications when fields were in better condition. Reports indicate that fertilizer use in 14 States was up 30 percent in July through October 1974 compared to the same period a year earlier.

Fertilizer Use by Crops

The Statistical Reporting Service obtained the data concerning fertilizer use on corn, cotton, soybeans, and wheat through interviews with farm operators. The "objective yield surveys" included the principal producing States, which accounted for 89 percent or more of the acres of the above crops harvested in 1973. These four crops accounted for over half of the principal crop acres harvested and well over half of all fertilizer used in farming.

These fertilizer use estimates are based on a stratified, random sample of fields in each State and for each crop. However, these estimates of N, P₂O₅, and K₂O use are not official estimates of total fertilizer use. Compared with the 1969 Census of Agriculture figures, they tend to be higher. For example, in the objective yield survey, 93 percent of the corn fields were reported as fertilized in 1969, where the Census reported only 81 percent as fertilized.

Official estimates of fertilizer use by States can be found in "Consumption of Commercial Fertilizers in the United States," published by Statistical Reporting Service, U.S. Department of Agriculture. Consumption during each of the past 6 years is shown in appendix tables 1, 2, and 3.

Corn for Grain

Close to 94 percent of all corn fields in the survey

Table 7.—Changes in use of primary plant nutrients, year ended June 30, 1973, compared with year ended June 30, 1972

Region	N	P ₂ O ₅	K ₂ O
	Percent	Percent	Percent
Northeast	16	7	9
Lake States	3	2	3
Corn Belt	-2	-1	-3
Northern Plains	12	8	44
Appalachian	8	5	7
Southeast	4	18	--
Delta States	-7	--	-6
Southern Plains	11	7	2
Mountain	15	5	-10
Pacific	6	4	5
United States	4	4	2

--No change.

received some fertilizer in 1973 (tables 8 and 12). This figure, 2 percentage points below the percentage of fields fertilized in 1972, probably reflects the tight fertilizer supply situation in 1973. Not only was the proportion of acres fertilized down, but the rate of use was down for both nitrogen and P₂O₅. Only potash use per acre was up (table 13). Close to two-thirds of the corn fields were fertilized at or before seeding—about the same as in 1972.

The States where corn is fertilized the heaviest tend to be those where the crop is usually irrigated—Colorado, Kansas, and Nebraska. In Colorado, farmers averaged 167 pounds of N and 81 pounds of P₂O₅ an acre. Use of K₂O tends to be lowest in the Northern Plains States—South Dakota, Nebraska, Kansas—where the soil has a native high level of potassium.

The poor 1973 planting season is difficult to see from these data. In the Corn Belt States, however, the 4.6 percent of acres fertilized “after seeding” was up considerably from the 2.6 percent in 1972 (possibly an

indication of late seeding in some parts of the Corn Belt).

Cotton

According to the SRS Survey, 74 percent of all cotton fields harvested received some fertilizer in 1973 (tables 9 and 12). In 1972, 77 percent of the fields were fertilized.

Virtually all cotton is fertilized in the mature growing areas of the southeastern part of the United States. It is on this crop and in this part of the country that heavy use of commercial fertilizer first became an established farm practice as the soil was quickly depleted of its native, scarce supply of plant nutrients by early settlers.

In the newer growing area—Oklahoma, Texas, and in the West—the proportion of acres fertilized is well below the higher levels to the East. These relatively low levels of fertilization reflect the high risk of getting insufficient moisture for good crop

Table 8.—Fertilizer use on corn acreage harvested for grain, selected States, 1973

State	Acres for harvest ¹	Fields in survey	Acres receiving				Rate per acre receiving			Acres fertilized ²		
			Any fert.	N	P ₂ O ₅	K ₂ O	N	P ₂ O ₅	K ₂ O	At or before seeding	After seeding	At or before and after seeding
	1,000 acres	Number	Percent	Percent	Percent	Percent	Pounds	Pounds	Pounds	Percent	Percent	Percent
Pennsylvania	1,060	242	97.1	96.3	94.6	93.8	87.5	69.4	57.8	93.2	1.7	5.1
Delaware	188	80	97.5	97.5	96.2	97.5	101.6	74.0	100.7	50.0	0.0	50.0
Maryland	510	79	98.7	98.7	98.7	97.5	110.7	85.0	94.2	48.7	1.3	50.0
3 States	1,758	401	97.6	97.1	96.0	95.3	95.8	74.5	73.3	75.5	1.4	23.1
Michigan	1,650	88	97.7	97.7	97.7	96.6	86.9	76.3	76.2	59.3	0.0	40.7
Wisconsin	2,050	145	97.9	97.9	95.9	97.2	75.5	60.5	85.8	57.0	.7	42.3
Minnesota	5,450	169	93.5	92.9	89.9	88.8	98.2	63.7	72.5	85.4	1.3	13.3
3 States	9,150	402	95.2	94.9	92.6	92.1	90.9	65.4	76.3	74.0	.9	25.0
Ohio	3,050	317	96.8	95.6	93.1	93.7	100.1	79.3	81.7	65.8	3.6	30.6
Indiana	5,200	259	98.8	98.1	98.1	98.1	114.9	77.0	104.6	53.5	.8	45.7
Illinois	9,580	223	95.1	93.7	88.8	87.9	123.4	70.3	82.8	53.3	4.2	42.5
Iowa	11,150	204	93.6	93.1	83.8	79.9	109.0	59.3	54.7	70.7	6.8	22.5
Missouri	2,600	154	94.8	94.8	85.7	85.1	126.5	55.7	61.0	69.2	5.5	25.3
5 States	31,580	1,157	95.3	94.5	88.7	87.1	114.9	67.6	75.9	61.9	4.6	33.5
South Dakota	2,780	100	63.0	63.0	55.0	27.0	61.8	30.9	16.1	71.4	9.5	19.1
Nebraska	5,840	178	92.4	92.4	73.7	50.0	139.3	42.4	21.2	51.6	6.0	42.4
Kansas	1,440	126	96.0	96.0	65.1	42.1	153.9	54.7	29.3	76.9	6.6	16.5
3 States	10,060	404	84.8	84.8	67.3	42.5	125.8	41.5	21.4	59.8	6.8	33.4
Virginia	520	113	100.0	100.0	98.2	98.2	124.5	79.7	104.0	30.1	8.0	61.9
North Carolina	1,380	273	94.5	94.5	71.4	71.4	143.7	56.4	70.8	8.9	23.3	67.8
Kentucky	1,000	235	97.9	97.9	91.5	90.6	120.4	77.9	79.6	60.4	2.2	37.4
3 States	2,900	621	96.7	96.7	83.1	82.8	132.0	69.5	81.2	30.8	13.1	56.1
Georgia	1,670	203	97.5	97.5	97.0	97.5	117.3	51.8	75.0	11.1	4.0	84.9
Colorado	436	250	96.4	96.4	75.6	19.2	166.8	80.9	43.4	35.3	11.6	53.1
19 States	57,554	3,438	93.7	93.2	85.7	79.9	113.5	63.5	71.0	60.6	4.7	34.7

¹“Crop Production”, Cr Pr 2-2 (10-73) Crop Reporting Board, SRS, USDA, October 12, 1973. ²Percentages apply to acres receiving fertilizer. ³In 1973, 61,479,000 acres of corn

were for harvest for grain in 41 States. The 19 States shown accounted for 94 percent of the total acres.

Table 9.—Fertilizer use on cotton acreage harvested, selected States, 1973

State	Acres for harvest ¹	Fields in survey	Acres receiving				Rate per acre receiving			Acres fertilized ²		
			Any fert.	N	P ₂ O ₅	K ₂ O	N	P ₂ O ₅	K ₂ O	At or before seeding	After seeding	At or before and after seeding
	1,000 acres	Number	Percent	Percent	Percent	Percent	Pounds	Pounds	Pounds	Percent	Percent	Percent
Missouri	190	68	100.0	88.2	94.1	97.1	46.9	54.3	77.1	64.7	13.2	22.1
North Carolina	170	58	98.3	98.3	94.8	98.3	85.7	67.8	92.3	12.3	5.3	82.4
Tennessee	450	85	100.0	100.0	100.0	100.0	67.4	68.5	68.5	87.1	4.7	8.2
2 States	620	143	99.5	99.5	98.6	99.5	72.4	68.3	74.9	66.8	4.8	28.3
South Carolina	304	90	100.0	100.0	98.9	98.9	98.5	72.4	102.0	7.8	4.4	87.8
Georgia	395	91	100.0	100.0	100.0	100.0	95.4	64.6	101.8	23.1	5.5	71.4
Alabama	533	105	99.0	99.0	95.2	97.1	82.4	77.0	83.4	37.5	1.9	60.6
3 States	1,232	286	99.6	99.6	97.7	98.5	90.6	71.8	94.0	25.5	3.7	70.8
Mississippi	1,359	357	100.0	99.7	48.5	50.1	89.6	63.9	64.7	49.4	24.6	26.0
Arkansas	980	259	96.9	96.9	69.9	68.7	68.9	45.4	50.1	72.9	10.4	16.7
Louisiana	530	100	91.0	91.0	60.0	60.0	71.3	58.7	60.3	63.7	27.5	8.8
3 States	2,869	716	97.3	97.1	57.9	58.3	79.4	55.3	58.0	59.9	20.3	19.9
Oklahoma	510	104	50.0	50.0	45.2	34.6	33.8	33.4	17.1	90.4	3.8	5.8
Texas	5,500	672	53.2	53.2	41.2	15.2	45.7	44.9	13.7	82.6	11.2	6.2
2 States	6,010	776	52.9	52.9	41.5	16.8	44.7	43.8	14.3	83.2	10.6	6.2
New Mexico	135	58	63.8	63.8	37.9	5.2	60.2	64.4	17.9	46.0	48.6	5.4
Arizona	280	105	87.6	87.6	53.3	1.9	120.0	65.8	34.2	14.2	46.7	39.1
2 States	415	163	79.9	79.9	48.3	3.0	104.5	65.4	24.9	22.5	47.2	30.3
California	935	227	91.7	88.2	44.7	8.7	124.5	83.6	49.5	32.8	37.2	30.0
14 States ^{2 3}	12,271	2,397	74.9	74.4	55.1	38.8	72.9	53.2	62.0	60.0	16.1	23.9

¹"Crop Production", Cr Pr 2-2 (10-73) Crop Reporting Board, SRS, USDA, October 12, 1973. ²Percentages apply to acres receiving fertilizer. ³In 1973, 12,370,800 acres of cotton

were for harvest in 19 States. The 14 States shown accounted for more than 99 percent of the total acres.

production. Generally, in the southwestern and western parts of the country, cotton is heavily fertilized only when it is irrigated. Where moisture supplies are short, farmers tend to use less fertilizer. Many use none.

As is true of corn acres, the proportion of cotton acres receiving N, P₂O₅, or K₂O was generally down in 1973 as was the rate of fertilization per acre receiving (tables 12 and 13). This decrease is indicative of the tight fertilizer supply—particularly nitrogen and phosphates.

Soybeans for Beans

The percentage increase in acres of soybeans harvested was greater—22 percent more acres in 1973 than in 1972—than for each of the other 3 crops included in the survey (tables 10, 12, and 13). In addition, the proportion of acres fertilized was up 2 percentage points and the rates of use of P₂O₅ and K₂O were up. Many agronomists believe that soybeans do not need nitrogen applications in addition to the amount fixed by the plant itself. However, liberal applications of phosphate and potash usually are recommended. Because of the increased number of acres and the trend toward

greater use of fertilizer, the soybean crop is one that will contribute to continuation of the long-time upward trend in fertilizer use.

Wheat

Because of the large number of acres of wheat throughout the country, the fairly high proportion of acres fertilized, and the relatively high rates of use, wheat is second only to corn as a user of fertilizer.

Wheat is comparatively well fertilized in the humid parts of the country. More than 90 percent of the wheat fields in the Midwest received some fertilizer in 1973 (table 11). In 2 States—Michigan and Indiana—all survey respondents reported that their wheat fields were fertilized with N, P₂O₅, or K₂O. Most of the wheat, however, is grown in the Plains States from North Dakota south to Texas. Only about 60 percent of the wheat fields were fertilized in this vast area. Furthermore, in a big part of these States, the average application of fertilizer was well below levels elsewhere.

Although wheat responds well to N, P₂O₅, and K₂O, little K₂O is used in the western half of the country. Here the native supply in the soil is considered ample for crop production by many

Table 10.—Fertilizer use on soybean acreage harvested for beans, selected States, 1973

State	Acres for harvest ¹	Fields in survey	Acres receiving				Rate per acre receiving			Acres fertilized ²		
			Any fert.	N	P ₂ O ₅	K ₂ O	N	P ₂ O ₅	K ₂ O	At or before seeding	After seeding	At or before and after seeding
	1,000 acres	Number	Percent	Percent	Percent	Percent	Pounds	Pounds	Pounds	Percent	Percent	Percent
Minnesota	4,400	113	25.7	23.0	24.8	23.9	11.7	30.5	38.9	100.0	--	--
Ohio	3,560	122	49.2	41.8	48.4	48.4	12.4	43.8	50.6	91.7	6.7	1.6
Indiana	4,270	125	63.2	54.4	61.6	63.2	9.4	36.7	59.7	92.4	3.8	3.8
Illinois	9,230	152	28.9	15.8	27.0	27.6	18.9	54.8	69.0	100.0	--	--
Iowa	7,850	148	16.2	9.5	15.5	15.5	10.2	41.9	47.7	100.0	--	--
Missouri	4,750	145	24.8	18.6	22.8	24.8	9.8	34.4	46.0	91.7	8.3	--
5 States	29,660	692	32.3	23.3	30.8	31.6	12.2	43.4	57.3	95.3	3.3	1.4
Nebraska	1,200	52	23.1	23.1	19.2	15.4	18.8	29.3	16.0	83.4	8.3	8.3
Kansas	1,155	53	18.9	18.9	18.9	18.9	20.7	31.6	20.8	90.0	--	10.0
2 States	2,355	105	21.0	21.0	19.1	17.1	19.6	30.4	18.6	86.3	4.6	9.0
North Carolina	1,460	73	69.9	61.6	67.1	68.5	14.2	37.4	64.8	98.0	2.0	--
Tennessee	1,560	73	60.3	45.2	58.9	58.9	23.9	43.8	44.6	100.0	--	--
2 States	3,020	146	64.9	53.1	62.9	63.5	18.5	40.5	55.1	99.0	1.0	--
South Carolina	1,260	73	82.2	63.0	82.2	82.2	15.4	42.4	74.6	91.7	8.3	--
Mississippi	2,750	136	19.1	11.8	19.1	19.1	19.1	52.7	53.5	92.4	3.8	3.8
Arkansas	4,620	158	29.1	13.9	27.2	28.5	10.9	37.3	50.4	97.8	2.2	--
Louisiana	1,710	109	27.5	19.3	27.5	26.6	19.7	58.0	58.4	100.0	--	--
3 States	9,080	403	25.8	14.3	24.8	25.3	15.2	45.2	52.7	97.0	2.1	.9
14 States	49,775	1,532	33.3	24.4	32.0	32.4	13.8	41.9	55.3	95.8	3.0	1.2

¹ "Crop Production", Cr Pr 2-2 (10-73) Crop Reporting Board, SRS, USDA, October 12, 1973. ² Percentages apply to acres receiving fertilizer. ³ In 1973, 56,173,000 acres of soybeans

were harvested for beans in 30 States. The 14 States shown accounted for 89 percent of the total acres.

-- Not Available.

growers. Over time, however, the surface level of the soil may become depleted to the point where the use of potash will become necessary.

Most of the wheat grown in the country is winter wheat that was seeded in the fall. Survey results indicate that farmers probably were able to obtain most of the nitrogen and phosphate fertilizers they needed in the fall of 1972 before supplies tightened. More acres were planted in 1972 for harvest in 1973 and both the percentages of fields fertilized and the rates of use, except for potash, were up over the previous year. (tables 12 and 13).

U.S. Foreign Trade

The value of U.S. fertilizer exports was \$468.2 million in 1972/73, about 38 percent greater than during 1971/72 (table 14). Both higher unit prices (figures 3 and 4) and larger quantities of several fertilizers sold in foreign markets contributed to the increase in the total value of exports.

Fertilizer exports of \$93 million financed by the United States Agency for International Developed (AID) in 1972/73 were nearly double those of 1971/72 (table 16). This increase was the result of a 33 percent increase in tonnage and significantly higher prices, especially for urea, diammonium phosphate (DAP), and concentrated superphosphate (CSP) (figure 5).

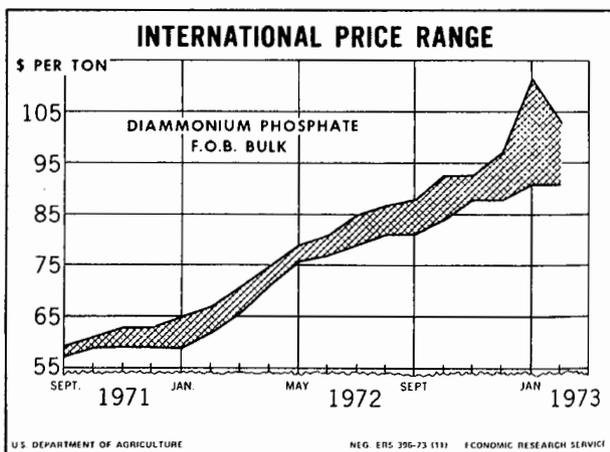


Figure 3

About 11 percent of the 3.7 million tons of all primary plant nutrients, except phosphate rock, exported in 1972/73 was financed by AID. However, AID exports accounted for only 2 percent of total plant nutrients produced in the United States in 1972/73.

Nitrogen Fertilizer

The United States was a net importer of urea, ammonium nitrate, nitrogen solutions, and sodium

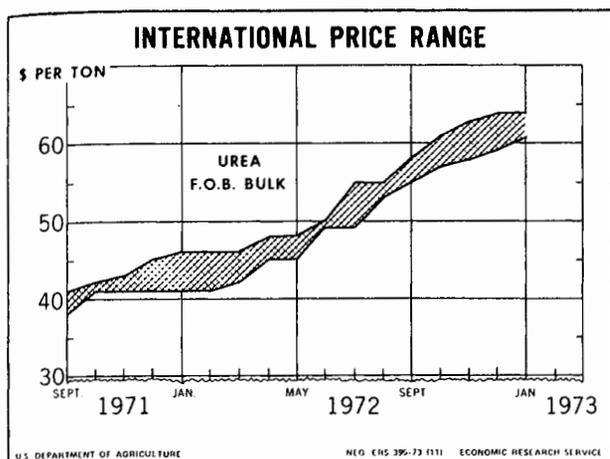


Figure 4

nitrate in 1972/73 (tables 15 and 17). However, as a result of a 63 percent and 34 percent increase in exports of anhydrous ammonia and ammonium phosphates, respectively, the United States remained a net exporter of nitrogen by nearly 2 to 1. These larger exports helped deplete U.S. inventories, which resulted in restricted domestic availability. Imports of all fertilizers containing nitrogen, except urea,

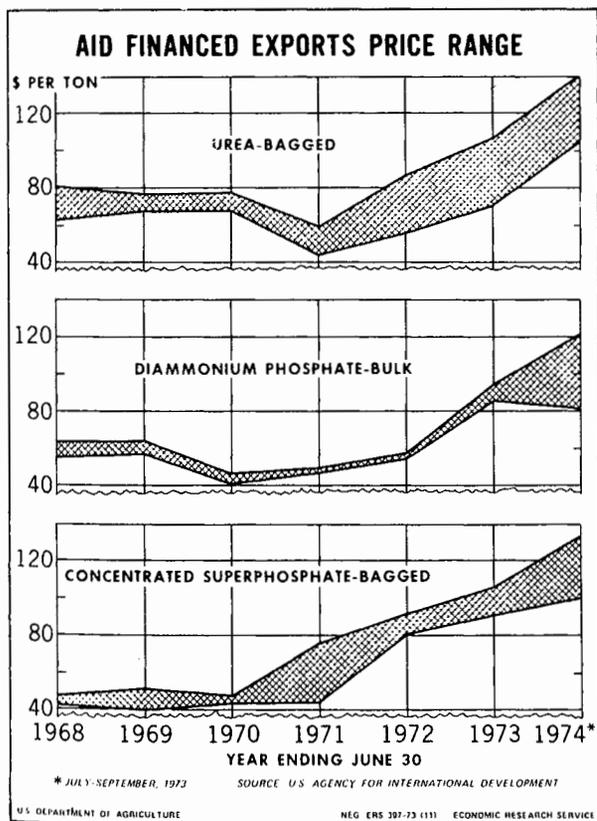


Figure 5

ammonium sulfate, nitrogen solutions, and mixed materials, decreased in 1972/73.

Of the 300,000 tons of nitrogen exports financed by AID in 1972/73, 31 percent was supplied by offshore producers. The 207,000 tons supplied by U.S. producers comprised about 15 percent of total nitrogen exports.

AID financed 86 percent of the U.S. urea exports, 51 percent of the mixed materials, and 15 percent of the DAP. Shipments of 147,000 tons of urea to South Vietnam and 101,000 tons of urea to Singapore accounted for 28 percent and 19 percent respectively of total U.S. urea exports of 523,000 tons in 1972/73 (table 18). The third largest recipient of AID-financed urea was Bangladesh. This country received 93,000 tons, accounting for 18 percent of total urea exports.

Prices of nitrogen exports financed by AID increased in 1972/73. Bagged urea prices ranged from \$73 to \$109 a ton and bagged ammonium sulfate prices averaged \$57 a ton.

Phosphates

The global, tight supply-demand balance for phosphates in 1972/73 stimulated an increase in U.S. export tonnage of 4 percent and an increase in value of 38 percent. Also, export prices of CSP and DAP advanced significantly to record levels. For the fourth straight year, export prices were above domestic prices for these fertilizers.

India, Brazil, and Italy accounted for 45 percent of the ammonium phosphate exports (table 20). Brazil also was our major market for CSP, taking 400,000 tons, nearly half of our total CSP exports.

Phosphate rock exports were 13.6 million tons in 1972/73, about the same as in the previous year. Canada, Japan, and West Germany again were the leading buyers.

In 1972/73, AID financed about 203,000 tons of P₂O₅, 21,000 of which were supplied by offshore suppliers. The 182,000 tons supplied by U.S. producers represented about 13 percent of the total U.S. exports of P₂O₅.

Significant increase in average prices paid for DAP and CSP pushed AID-financed export prices to 22 percent and 40 percent, respectively, above the domestic levels. Prices for AID-financed DAP continued to increase in July-September 1973, ranging from \$81 to \$121 a ton. Most of the requests for bids were oversubscribed early in the period. But by September, the tonnage offered was less than that sought, partly because U.S. producers were reluctant to export additional material.

Potash

Increases in both imports and exports were important to the U.S. potash industry in 1972/73. Canada supplied 96 percent of the U.S. imports of

Table 11.—Fertilizer use on all wheat acreage harvested, selected States, 1973

State	Acres for harvest ¹	Fields in survey	Acres receiving				Rate per acre receiving			Acres fertilized ²		
			Any fert.	N	P ₂ O ₅	K ₂ O	N	P ₂ O ₅	K ₂ O	At or before seeding	After seeding	At or before and after seeding
	1,000 acres	Number	Percent	Percent	Percent	Percent	Pounds	Pounds	Pounds	Percent	Percent	Percent
Michigan	570	64	100.0	100.0	100.0	100.0	39.7	57.5	54.0	70.3	3.1	26.6
Minnesota	1,930	57	91.2	91.2	87.7	70.2	53.7	33.2	17.1	88.5	1.9	9.6
2 States	2,500	121	93.2	93.2	90.5	77.0	50.3	39.3	28.0	84.0	2.2	13.8
Ohio	720	70	98.6	98.6	97.1	97.1	40.9	63.0	62.5	56.5	2.9	40.6
Indiana	695	71	100.0	98.6	98.6	98.6	57.7	62.6	62.6	42.3	2.8	54.9
Illinois	1,280	71	90.1	64.8	84.5	83.1	59.8	55.0	59.6	57.8	6.3	35.9
Missouri	850	77	85.7	80.5	59.7	54.5	78.5	50.4	53.0	47.0	34.8	18.2
4 States	3,545	289	92.7	82.1	83.9	82.1	59.1	57.8	60.0	51.8	11.1	37.1
North Dakota	8,800	277	74.4	72.6	73.8	10.3	22.6	27.7	10.8	98.3	0.5	1.2
South Dakota	2,195	134	39.4	38.8	36.6	5.7	23.5	20.0	7.5	98.5	1.5	0.0
Nebraska	2,780	121	52.9	51.2	14.9	6.6	51.3	33.5	9.4	79.7	18.8	1.5
Kansas	10,300	272	66.5	66.2	42.3	8.1	53.6	40.6	22.4	71.8	6.1	22.1
4 States	24,075	804	65.3	64.3	50.0	8.5	38.9	32.1	15.2	85.0	4.7	10.3
Oklahoma	5,190	167	64.7	64.7	45.5	15.6	60.6	47.4	34.8	69.5	8.3	22.2
Texas	3,400	156	41.7	41.7	16.5	11.7	102.9	51.6	19.6	72.0	6.8	21.2
2 States	8,590	323	55.6	55.6	34.0	14.1	73.2	48.2	29.8	70.2	7.9	21.9
Montana	4,080	217	40.3	38.1	36.5	3.5	13.9	22.7	8.5	93.8	3.1	3.1
Idaho	1,090	119	71.1	70.5	17.7	1.6	71.3	34.0	12.4	63.5	14.6	21.9
Colorado	2,370	110	9.1	9.1	4.5	.9	54.2	19.2	10.0	75.0	25.0	0.0
3 States	7,540	446	34.9	33.7	23.7	2.4	34.7	23.7	9.0	83.3	8.3	8.4
Washington	2,230	123	98.4	98.4	9.8	0.0	66.5	42.8	0.0	88.4	2.5	9.1
Oregon	940	70	88.6	88.6	5.7	0.0	46.6	25.4	0.0	82.3	4.8	12.9
2 States	3,170	193	95.5	95.5	8.6	0.0	61.0	39.4	0.0	86.7	3.1	10.2
17 States ^{2 3}	49,420	2,176	64.3	62.9	45.0	16.7	47.7	37.8	35.9	79.3	5.8	14.9

¹"Crop Production", Cr Pr 2-2 (10-73) Crop Reporting Board, SRS, USDA, October 12, 1973. ²Percentages apply to acres receiving fertilizer. ³In 1973, 53,718,000 acres of all wheat were

harvested in 42 States. The 17 States shown accounted for 92 percent of the total acres.

muriate of potash (table 19). Imports of 3 million tons of K₂O equivalent from Canada supplied 69 percent of U.S. consumption, compared with 68 percent in 1971/72. Although imports were up 3 percent over a year earlier, higher consumption pushed inventories down 48 percent.

Although Saskatchewan Provincial officials did not raise the mine price for potash in 1972/73, the U.S. average import declared value increased about 10 cents per ton of K₂O.

World Trade Outlook

The deteriorating global balance between fertilizer supply and demand was further aggravated by crop failures in some parts of the world in 1972. This amplified already strong demand for fertilizers in most of the affected countries as they sought to recoup lost crop output. Inasmuch as fertilizer supplies were limited, prices steadily advanced on the world market.

Nitrogen

The growing world demand for nitrogen fertilizers may push global nitrogen usage to 42.6 million tons in 1973/74. This level would represent a 7.6 percent increase, compared with the 5.3 percent rise in 1972/73. The realization of this high consumption level depends on the performance of numerous ammonia plants recently completed and those to be completed in 1974, especially in the export-oriented countries of Venezuela, Kuwait, and in Eastern Europe.

Nitrogen supply beyond 1975 is difficult to estimate. But several countries are planning expanded production. Venezuela has plans for installing a large capacity ammonia plant with export potential. Nigeria and other countries in Africa and Latin America are exploring the possibilities of erecting ammonia plants. China is building a number of small plants, has entered into contracts for the construction of one large-scale

Table 12.—Percentage of fields of corn, cotton, soybeans, and all wheat receiving fertilizer in selected States, 1964-73

Crop and year	Fields in survey	Acres receiving			
		Any fertilizer	N	P ₂ O ₅	K ₂ O
	<i>Number</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>
Corn					
1964	2,875	85	85	78	72
1965	3,322	88	88	82	77
1966	3,338	91	91	86	80
1967	3,412	92	92	87	82
1968	3,107	93	92	89	84
1969	3,060	93	93	87	82
1970	3,107	95	94	90	85
1971	2,606	94	94	88	82
1972	2,581	96	96	90	86
1973	3,438	94	93	86	80
Cotton					
1964	2,262	78	77	58	43
1965	2,503	79	79	59	44
1966	2,433	77	76	59	45
1967	2,448	73	72	56	40
1968	2,440	74	73	56	43
1969	2,460	76	75	54	39
1970	2,447	72	72	48	36
1971	2,320	75	74	50	39
1972	2,396	77	77	55	41
1973	2,379	75	74	55	39
Soybeans					
1964	1,073	13	7	12	12
1965	1,106	18	11	16	17
1966	1,307	27	18	26	24
1967	1,460	28	21	27	27
1968	1,495	29	21	27	27
1969	1,503	27	19	26	27
1970	1,552	29	21	27	28
1971	1,532	28	19	27	27
1972	1,528	31	22	29	31
1973	1,532	33	24	32	32
All Wheat					
1964	1,792	50	47	36	16
1965	1,960	52	48	38	15
1966	2,241	54	49	38	15
1967	2,146	58	53	43	17
1968	2,119	60	56	43	17
1969	2,047	59	56	44	17
1970	2,068	63	61	44	20
1971	2,230	58	57	41	14
1972	2,062	63	62	44	15
1973	2,176	64	63	45	17

¹ States included for each crop are shown in Tables 8, 9, 10, and 11.

ammonia and urea plant, and plans 5 more large plants. Japan is increasing investments in fertilizer plants in different parts of the world because of feedstock and pollution problems at home. India and Iraq are participating in a joint-venture ammonia plant in Iraq. Also, India is negotiating with Kuwait to build an ammonium phosphate plant in that country.

Phosphate

High analysis phosphate materials are likely to be in worldwide tight supply at least for another 6 months. By the latter part of 1974, world capacity

should increase about 12 percent and continue to increase into 1975 and 1976.

In 1974/75, phosphoric acid production is expected to be up 28 percent. A lion's share of the increase will be in concentrated superphosphate and diammonium phosphate production and exportation in the principal exporting countries—United States, Tunisia, the Netherlands, and Portugal. These increases in supply may result in downward pressures on prices in 1974/75.

Potash

Increases in U.S. production, imports, and exports

were the salient points in the U.S. potash industry. Saskatchewan, Canada, supplied 96 percent of the U.S. imports of muriate of potash. Saskatchewan did

increase production allowables but did not change prices in 1972/73. The slight increase in value of K₂O imports was partly due to increased freight rates.

Table 13.—Quantity of fertilizer used and time of application on corn, cotton soybeans, and all wheat in selected States, 1964-1973¹

Crop and year	Rate per acre receiving—			Time of fertilization			Harvested acreage United States ²
	N	P ₂ O ₅	K ₂ O	At or before seeding	After seeding only	At or before and after seeding	
	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>1,000 acres</i>
Corn							
1964	58	41	35	54	6	40	55,369
1965	75	50	48	50	5	44	55,332
1966	86	57	57	53	3	44	56,933
1967	93	60	60	58	3	40	60,557
1968	104	64	65	66	2	32	55,880
1969	110	64	67	62	2	36	54,598
1970	112	71	72	64	2	34	57,224
1971	107	62	64	68	3	29	64,047
1972	115	66	69	63	4	33	57,421
1973	114	64	71	60	5	35	³ 61,760
Cotton							
1964	69	50	37	49	15	36	14,055
1965	81	55	57	47	12	41	13,615
1966	84	55	58	50	12	39	9,552
1967	79	55	55	60	11	29	7,997
1968	80	57	58	54	13	33	10,160
1969	91	60	57	56	15	29	11,058
1970	75	55	57	68	11	22	11,160
1971	75	53	58	65	13	22	11,471
1972	75	55	61	62	14	24	12,984
1973	73	53	62	60	16	24	³ 11,989
Soybeans							
1964	14	30	37	99	1	(⁴)	30,793
1965	10	32	39	97	3	(⁴)	34,449
1966	12	34	41	96	3	(⁴)	36,546
1967	13	37	42	97	3	(⁴)	39,767
1968	15	37	45	96	2	1	41,104
1969	12	41	48	98	1	(⁴)	40,982
1970	14	37	51	99	1	(⁴)	42,056
1971	15	39	48	99	1	(⁴)	42,701
1972	14	42	51	97	2	1	45,698
1973	14	42	55	96	3	1	³ 56,416
All Wheat							
1964	27	27	19	68	16	16	49,762
1965	31	30	35	67	16	17	49,560
1966	32	32	37	65	17	18	49,867
1967	35	32	39	75	7	18	58,771
1968	36	32	36	68	14	18	55,262
1969	38	34	39	77	8	15	47,577
1970	39	30	36	76	8	16	44,141
1971	40	34	36	77	7	16	47,674
1972	46	37	38	73	7	20	47,284
1973	48	38	36	79	6	15	³ 53,718

¹ States included for each crop are shown in Tables 8, 9, 10, and 11. ² Does not include Alaska or Hawaii. ³ Preliminary. ⁴ Less than 0.5 percent.

Table 14.—Fertilizer exports: Declared values of specified fertilizers exported from the United States, years ending June 30, 1971-73

Fertilizer	1971	1972	1973 ¹
	Million dollars	Million dollars	Million dollars
Urea	21.6	21.4	32.0
Ammonium nitrate	3.0	1.9	1.3
Ammonium sulfate	9.2	9.8	13.4
Sodium nitrate	--	.1	.1
Anhydrous ammonia fertilizer	19.7	13.2	24.4
Phosphate rock (hard)	86.7	90.9	93.9
Phosphate rock (fertilizer)	9.5	11.9	10.0
Normal superphosphate .....	.6	.3	1.7
Concentrated superphosphate	23.0	33.1	52.4
Ammonium phosphates	59.4	91.6	157.4
Potassium chloride	22.4	28.1	40.7
Potassic chemical fertilizer NEC ..	9.5	9.2	11.2
Mixed fertilizer NEC	19.0	17.8	28.1
Nitrogenous chemical fertilizer ...	5.0	9.6	1.6
Total	288.6	338.9	468.2

¹ Preliminary.

--None Reported.

Source: U.S. Exports, Schedule B—Commodity and Country, Report FT 410, Bureau of Census, published monthly.

Table 15.—U.S. imports of specified fertilizer materials, years ending June 30, 1970-73

Fertilizer	1970	1971	1972	1973 ¹
	1,000 tons	1,000 tons	1,000 tons	1,000 tons
Anhydrous ammonia	477	501	393	343
Ammonium nitrate	306	367	390	329
Ammonium sulfate	179	228	264	276
Sodium nitrate	164	188	160	74
Urea	424	330	365	672
Nitrogen solutions	98	194	120	145
Phosphate, crude	154	123	67	43
Ammonium phosphates	395	472	489	434
Potassium chloride	4,378	4,115	5,082	5,250
Potassium sulfate	70	63	48	54
Phosphate fertilizer	--	--	54	167
Fertilizer (NSPF)	--	--	198	233

¹ Preliminary.

--None Reported.

Source: U.S. Imports—Commodity and Country, Report FT 135, U.S. Bureau of Census, published monthly.

Table 16.—Fertilizer exports: Sales financed by the U.S. Agency for International Development, years ending June 30, 1972-73

Fertilizer	1972		1973	
	Quantity	Amount	Quantity	Amount
	1,000 tons	1,000 dollars	1,000 tons	1,000 dollars
Ammonium sulfate	9	395	9	437
Ammonium phosphate	(¹)	20	--	--
Diammonium phosphate	269	16,944	306	30,714
Urea	239	14,829	448	37,905
Concentrated superphosphate	34	3,117	63	6,185
Potassium chloride	5	241	11	427
Potassium sulfate	9	546	6	339
Mixed fertilizer	201	12,344	190	17,171
Anhydrous ammonia	13	431	--	--
Total	779	48,867	1,033	93,178

¹ Less than 1,000 tons.

-- None Reported.

Source: Agency for International Development.

Table 17.—U.S. exports of specified fertilizer materials, years ending June 30, 1970-73

Fertilizer	1970	1971	1972	1973 ¹
	1,000 tons	1,000 tons	1,000 tons	1,000 tons
Anhydrous ammonia	764	598	421	685
Ammonium nitrate	81	59	59	21
Ammonium sulfate	528	601	558	486
Urea	670	374	464	523
Phosphate rock	10,965	12,757	13,580	13,577
Normal superphosphate	37	18	14	60
Concentrated superphosphate	711	627	724	860
Ammonium phosphates	986	1,135	1,542	2,069
Potassium chloride	902	772	859	1,247
Potassium chemical fertilizer	136	238	211	240
Fertilizer materials	404	317	243	373

¹ Preliminary.

Source: U.S. Exports, Schedule B—Commodity and Country, Report FT 410, U.S. Bureau of the Census, published monthly.

Table 18.—Nitrogen fertilizers: U.S. exports by country of destination, year ending June 30, 1973

Country of destination	Ammonium sulfate	Anhydrous ammonia	Urea
	1,000 tons	1,000 tons	1,000 tons
Canada	33	7	8
Mexico	97	168	--
Salvador	52	--	7
Jamaica	19	--	--
Dominican Republic	67	--	29
Brazil	164	25	67
Italy	6	6	18
India	11	--	--
Bangladesh	10	--	93
Nicaragua	18	--	--
Trinidad	--	28	--
Finland	--	63	--
Denmark	--	144	--
United Kingdom	--	28	--
Norway	--	17	--
Costa Rica	--	22	--
Spain	--	35	--
N. Antilles	--	9	--
Turkey	--	32	--
Colombia	--	19	--
France	--	37	9
Portugal	--	12	--
Venezuela	--	--	13
S. Vietnam	--	--	147
Cambodia	--	--	7
Singapore	--	--	101
Argentina	--	--	10
Other countries	9	33	14
Total	486	685	523

Source: U.S. Exports, Schedule B—Commodity and Country, Report FT 410, U.S. Bureau of Census, published monthly.

--None Reported.

Table 19.—Imports of specified potash materials, K²O equivalent, into the United States, years ending June 30, 1972-73, by country or origin

Country	1972		1973	
	Muriate of potash	Sulfates	Muriate of potash	Sulfates
	1,000 tons	1,000 tons	1,000 tons	1,000 tons
Brazil	--	--	7	--
Brazzaville	--	--	12	--
Canada	2,947	(¹)	3,036	--
Chile	2	--	2	--
France	8	2	2	11
Germany (West)	(¹)	21	--	16
Israel	91	--	72	--
Netherlands	--	--	4	--
Spain	--	--	11	--
Zaire	--	--	3	--
Congo	1	--	--	--
Other countries	--	1	--	--
Total	3,049	24	3,150	27

¹ Less than 100 tons.

-- None Reported.

Source: Mineral Industry Surveys, Bureau of Mines. (Potash, Crop Year Annual), September 14, 1973.

NOTE: Detail may not add to totals because of rounding.

Table 20.—Phosphate fertilizer: U.S. exports, by country of destination, year ending June 30, 1973

Country of destination	Phosphate rock	Ammonium phosphates	Concentrated superphosphate
	1,000 tons	1,000 tons	1,000 tons
China T	84	--	--
Canada	3,223	73	46
Mexico	871	--	6
Brazil	770	340	400
W. Germany	1,375	--	--
Japan	2,117	38	12
Poland	25	--	--
Romania	284	--	--
Salvador	17	40	--
Colombia	54	64	29
Peru	13	6	--
Uruguay	34	--	--
Sweden	108	--	--
United Kingdom	87	9	--
Netherlands	703	19	16
Belgium	688	15	--
Austria	133	--	--
Spain	250	--	--
Italy	615	238	20
Iran	364	--	--
Philippine Republic	162	--	--
Chile	26	120	56
Korean Republic	600	--	--
India	344	360	--
Norway	54	19	--
France	544	88	15
USSR	18	--	--
Nicaragua	--	13	--
Costa Rica	2	25	6
Dominican Republic	--	25	12
Switzerland	--	12	--
Ecuador	--	16	--
Argentina	--	42	22
Thailand	--	11	--
Singapore	--	17	70
Lebanon	--	70	--
S. Vietnam	--	30	--
New Zealand	--	19	--
Pakistan	--	199	--
Yugoslavia	--	100	--
Ethopia	--	11	--
Greece	--	12	--
AFRS Island	--	12	--
Algeria	--	10	25
Indonesia	--	--	55
Bangladesh	--	--	56
Other countries	12	16	14
Total	13,577	2,069	860

Source: U.S. Exports, Schedule B—Commodity and Country, Report FT 410, U.S. Bureau of the Census, published monthly.

-- None Reported.

Appendix table 1.—Use of nitrogen as fertilizer, by States, years ending June 30, 1968-73

State and region	1968	1969	1970	1971	1972	1973 Prelim.
	1,000 tons of N	1,000 tons of N	1,000 tons of N	1,000 tons of N	1,000 tons of N	1,000 tons of N
Maine	17.7	17.7	16.4	16.0	14.7	16.4
New Hampshire	1.9	2.0	2.1	2.3	2.3	2.6
Vermont	3.7	4.6	6.1	6.7	6.6	6.2
Massachusetts	7.8	8.5	8.2	7.7	8.9	10.2
Rhode Island	1.3	1.6	1.6	1.8	1.8	1.7
Connecticut	8.1	8.0	6.5	7.4	7.8	8.5
New York	74.5	72.3	70.0	75.1	77.2	83.6
New Jersey	23.0	21.0	22.7	27.4	21.4	24.5
Pennsylvania	72.4	75.3	82.9	86.4	76.1	90.1
Delaware	12.4	12.4	13.3	14.8	13.2	15.5
Maryland	41.0	35.6	40.2	57.1	42.3	57.3
Dist. of Columbia . . . . .	.6	.7	.7	.7	.6	.7
Northeast	264.4	259.7	270.7	303.4	272.9	317.3
Michigan	115.9	111.5	139.3	175.0	153.7	139.3
Wisconsin	90.5	104.0	115.1	122.5	129.1	116.6
Minnesota	251.2	343.6	283.9	411.3	374.4	423.6
Lake States	457.6	559.1	528.3	708.3	657.2	679.5
Ohio	194.5	199.5	225.7	276.5	242.3	230.3
Indiana	339.3	329.7	343.4	404.2	340.3	328.8
Illinois	579.4	610.2	595.5	713.9	549.7	545.9
Iowa	632.9	556.9	659.7	701.8	662.6	703.8
Missouri	280.1	250.7	300.7	326.0	329.1	275.7
Corn Belt	2,026.2	1,947.0	2,125.0	2,422.4	2,124.0	2,084.5
North Dakota	62.5	66.1	71.9	70.7	83.1	141.9
South Dakota	58.0	65.7	68.5	85.1	78.7	98.4
Nebraska	500.2	417.3	499.0	534.3	550.3	579.4
Kansas	355.0	374.6	443.9	438.0	467.2	499.1
Northern Plains	975.7	923.7	1,093.3	1,128.1	1,179.3	1,318.8
Virginia	67.9	69.8	77.6	86.1	83.2	91.3
West Virginia	6.2	6.3	6.7	6.9	7.8	7.6
North Carolina	164.7	169.6	195.5	207.6	192.4	216.5
Kentucky	88.3	108.0	101.5	113.8	108.9	97.6
Tennessee	93.0	104.5	96.7	105.5	99.1	116.1
Appalachian	420.1	458.2	478.0	519.9	491.4	529.1
South Carolina	85.7	91.3	90.6	93.0	91.3	96.7
Georgia	250.5	261.7	251.2	263.0	268.4	285.7
Florida	153.8	180.3	191.2	183.2	199.6	200.8
Alabama	125.0	137.6	140.7	152.8	163.5	167.0
Southeast	615.0	670.9	673.7	692.0	722.8	750.2
Mississippi	135.4	136.6	148.1	160.7	205.8	202.3
Arkansas	95.8	104.7	107.3	110.2	127.7	123.0
Louisiana	106.5	105.0	114.0	136.0	143.3	118.0
Delta States	337.7	346.3	369.4	406.9	476.8	443.3
Oklahoma	127.4	137.2	163.7	173.7	177.9	202.6
Texas	550.7	639.4	675.5	661.0	718.2	719.6
Southern Plains	678.1	776.6	838.6	834.7	896.1	922.2
Montana	30.4	33.6	36.8	41.2	37.7	47.2
Idaho	76.9	102.0	93.9	102.0	102.0	124.5
Wyoming	13.0	19.8	18.0	16.2	20.2	22.0
Colorado	70.5	70.7	80.1	85.9	91.0	95.7
New Mexico	29.3	30.6	30.3	29.6	29.4	40.3
Arizona	87.9	94.1	96.7	92.4	102.1	106.7
Utah	13.2	13.1	15.6	16.1	19.6	24.4
Nevada	2.6	2.9	3.3	3.4	3.9	4.6
Mountain	323.8	366.8	374.7	386.8	405.9	465.4
Washington	145.4	134.9	145.2	164.3	168.5	191.9
Oregon	84.7	79.7	86.0	94.1	96.6	108.5
California	407.2	387.2	414.8	419.8	473.2	478.9
Pacific	637.3	601.8	646.0	678.2	738.3	779.3
48 States + D.C.	6,735.9	6,910.0	7,407.7	8,080.9	7,964.5	8,289.1
Alaska . . . . .	.8	.7	1.0	1.0	.9	1.1
Hawaii	24.0	26.3	28.8	32.1	29.5	28.5
United States	6,760.7	6,936.7	7,437.3	8,113.9	7,994.9	8,318.7

Source: "Consumption of Commercial Fertilizers in the United States", SPCR7 (10-73) and earlier issues, Crop Reporting Board, SRS, USDA, Nov. 1, 1973.

Details may not add to totals because of rounding.

Appendix table 2.—Use of phosphorus as fertilizer, by States, years ending June 30, 1968-72

State and region	1968	1969	1970	1971	1972	1973 Prelim.
	<i>1,000 tons available P₂O₅</i>					
Maine	21.7	20.5	19.1	18.3	17.8	18.0
New Hampshire	1.8	2.0	2.0	2.2	2.0	1.7
Vermont	5.6	6.0	7.2	7.6	7.8	7.1
Massachusetts	6.7	6.6	6.3	6.8	6.3	7.7
Rhode Island	1.3	1.7	1.6	1.6	1.6	1.5
Connecticut	6.6	6.9	5.5	5.4	5.8	6.5
New York	84.5	93.7	83.8	88.2	90.5	78.1
New Jersey	24.2	20.7	19.6	21.7	18.7	19.9
Pennsylvania	83.6	84.9	92.0	96.7	87.6	96.9
Delaware	12.1	11.3	12.3	13.1	11.7	14.9
Maryland	39.6	36.9	40.3	53.5	42.3	59.0
Dist. of Columbia . . . . .	.4	.6	.7	.7	.6	.6
Northeast	288.1	291.8	290.4	315.8	292.7	311.9
Michigan	128.2	122.7	132.6	156.3	148.2	130.0
Wisconsin	115.8	120.9	120.1	133.3	135.8	130.9
Minnesota	214.1	292.4	223.1	295.3	261.5	293.6
Lake States	458.1	536.0	475.8	584.9	545.5	554.5
Ohio	208.4	211.6	214.5	233.5	237.9	232.0
Indiana	284.4	253.5	247.5	259.8	247.4	248.7
Illinois	457.5	496.7	459.1	443.5	458.2	458.5
Iowa	361.1	381.8	411.3	422.6	402.1	407.8
Missouri	165.4	160.2	168.4	169.9	192.2	176.1
Corn Belt	1,476.8	1,503.8	1,500.8	1,529.3	1,537.8	1,523.1
North Dakota	111.6	100.8	101.5	87.5	77.7	108.2
South Dakota	43.3	46.5	50.3	53.9	53.5	62.3
Nebraska	124.4	114.8	131.3	150.3	149.3	175.4
Kansas	159.2	161.0	170.4	152.8	174.3	145.0
Northern Plains	438.5	423.1	453.5	444.5	454.8	490.9
Virginia	78.8	81.1	78.9	84.7	79.3	77.3
West Virginia	9.1	9.4	10.4	9.9	11.8	11.3
North Carolina	131.9	127.0	134.4	137.8	135.0	162.1
Kentucky	86.8	97.9	90.4	104.4	104.7	97.9
Tennessee	87.9	90.5	83.8	89.4	93.9	98.5
Appalachian	394.5	405.9	397.9	426.2	424.7	447.1
South Carolina	75.4	72.2	66.7	69.0	71.1	73.2
Georgia	150.7	145.4	136.5	142.1	147.8	160.8
Florida	97.2	105.5	107.1	100.1	108.2	170.6
Alabama	109.9	105.4	105.6	104.7	114.1	117.0
Southeast	433.2	428.5	415.9	415.9	441.2	521.6
Mississippi	66.8	71.5	68.3	68.7	83.2	88.4
Arkansas	60.7	65.5	63.6	68.1	81.1	77.0
Louisiana	56.7	54.3	55.8	57.0	62.6	62.0
Delta States	184.2	191.3	187.7	193.8	226.9	227.4
Oklahoma	78.1	87.1	90.5	97.7	96.5	110.6
Texas	225.4	302.9	255.5	259.6	289.9	301.7
Southern Plains	303.5	390.0	346.0	357.3	386.4	412.3
Montana	44.2	44.6	49.8	56.8	59.5	44.7
Idaho	48.8	67.4	67.7	62.6	59.6	70.4
Wyoming	9.4	10.8	9.9	12.9	13.8	14.0
Colorado	41.8	41.9	41.8	43.1	45.5	49.2
New Mexico	14.1	16.1	15.0	16.9	15.0	22.1
Arizona	29.7	31.1	31.2	34.0	38.6	42.3
Utah	22.7	24.7	24.0	23.5	26.9	28.5
Nevada	1.6	1.8	2.2	1.9	2.4	2.7
Mountain	212.3	238.4	241.6	251.7	261.3	273.9
Washington	48.1	46.0	44.7	46.4	50.7	63.1
Oregon	40.3	40.0	44.9	42.7	41.9	43.0
California	149.1	141.8	146.4	170.0	177.7	175.9
Pacific	237.5	227.8	236.0	259.1	270.3	282.0
48 States + D.C.	4,426.7	4,636.6	4,545.6	4,778.6	4,842.0	5,044.4
Alaska . . . . .	.6	.7	.8	.6	.6	.7
Hawaii	15.3	15.6	19.1	16.8	22.1	19.1
United States	4,442.6	4,652.8	4,565.3	4,796.0	4,864.8	5,064.2

Source: "Consumption of Commercial Fertilizers in the United States", SPCR7 (10-73) and earlier issues, Crop Reporting Board, SRS, USDA, Nov. 1, 1973.

Details may not add to totals because of rounding.

Appendix table 3.—Use of Potassium as fertilizer, by States, years ending June 30, 1968-73

States and region	1968	1969	1970	1971	1972	1973 Prelim.
	<i>1,000 tons of K₂O</i>	1,000 tons of K_{2}O	1,000 tons of K_{2}O	1,000 tons of K_{2}O	1,000 tons of K_{2}O	1,000 tons of K_{2}O
Maine	21.3	20.6	20.1	18.9	17.1	18.8
New Hampshire	1.9	2.1	2.3	2.6	2.5	2.2
Vermont	5.3	5.8	7.6	7.9	7.8	7.5
Massachusetts	6.2	6.2	6.1	5.5	6.1	6.9
Rhode Island	1.2	1.3	1.3	1.4	1.6	1.5
Connecticut	6.2	6.8	5.6	5.6	5.8	6.7
New York	64.4	64.1	68.4	72.5	78.1	77.3
New Jersey	22.8	22.1	20.1	22.3	18.6	19.6
Pennsylvania	69.7	69.1	75.1	79.6	78.2	77.0
Delaware	15.1	14.6	15.9	17.3	16.2	18.5
Maryland	45.4	42.7	47.1	56.5	44.4	65.1
Dist. of Columbia . . . . .	.3	.5	.5	.5	.4	.4
Northeast	259.8	255.9	270.1	290.6	276.8	301.5
Michigan	136.1	137.4	153.0	179.0	165.6	164.3
Wisconsin	205.3	199.6	197.7	211.5	227.6	229.2
Minnesota	196.2	211.8	214.2	270.4	258.9	279.9
Lake States	537.6	548.8	564.9	660.9	652.1	673.4
Ohio	220.3	227.2	234.7	254.2	260.0	264.3
Indiana	303.1	387.9	302.5	329.4	305.1	327.7
Illinois	437.3	482.4	481.9	465.1	466.9	447.8
Iowa	299.0	310.2	347.3	352.9	367.1	332.4
Missouri	168.5	165.6	189.7	190.3	214.3	199.6
Corn Belt	1,428.2	1,473.3	1,556.1	1,591.9	1,613.4	1,571.8
North Dakota	9.2	9.2	9.5	10.8	9.4	10.7
South Dakota	6.9	7.8	10.2	10.2	9.9	11.3
Nebraska	32.6	35.7	36.8	44.2	43.1	60.1
Kansas	32.9	35.9	46.7	39.3	46.6	75.0
Northern Plains	81.6	88.6	103.2	104.5	109.0	157.1
Virginia	87.4	90.1	89.7	84.6	87.8	90.3
West Virginia	6.8	7.0	8.0	7.9	8.7	8.8
North Carolina	167.6	158.3	168.8	172.0	168.7	195.6
Kentucky	97.5	108.8	110.4	116.1	115.4	113.6
Tennessee	93.1	97.5	90.7	94.0	102.6	110.1
Appalachian	452.4	461.7	467.6	474.6	483.2	518.4
South Carolina	101.1	94.8	88.5	91.6	96.9	103.9
Georgia	213.2	203.7	188.8	207.2	220.3	237.6
Florida	181.9	209.1	215.7	205.0	226.3	200.6
Alabama	105.9	106.5	109.7	108.4	119.7	119.3
Southeast	602.1	614.1	602.7	612.2	663.2	661.4
Mississippi	64.3	66.0	64.2	64.5	77.3	74.7
Arkansas	68.5	76.3	73.4	77.9	88.5	79.9
Louisiana	48.3	47.5	53.2	55.8	61.3	58.9
Delta States	181.1	189.8	190.8	198.2	227.1	213.5
Oklahoma	27.1	28.9	36.1	32.3	34.1	38.8
Texas	73.4	90.9	90.6	105.8	108.9	107.0
Southern Plains	100.5	119.8	126.7	138.1	143.0	145.8
Montana	1.7	1.1	1.6	1.3	1.8	2.6
Idaho	4.4	4.1	4.2	4.0	3.5	5.3
Wyoming . . . . .	.6	1.2	1.1	1.3	1.3	1.5
Colorado	7.2	6.5	7.2	8.2	8.8	7.9
New Mexico	1.1	.9	1.2	1.8	1.6	2.8
Arizona	1.4	1.3	2.3	2.9	1.5	1.1
Utah . . . . .	.4	.3	.3	.3	.5	1.2
Nevada . . . . .	.2	.1	.2	.1	.1	.2
Mountain	17.0	15.5	18.1	19.9	19.1	22.6
Washington	23.7	17.9	19.6	19.4	21.1	23.9
Oregon	9.1	9.0	12.3	14.5	13.9	20.6
California	53.8	54.3	61.7	64.3	64.1	60.1
Pacific	86.6	81.2	93.6	98.2	99.1	104.6
48 States + D.C.	3,746.9	3,848.7	3,993.8	4,189.4	4,285.9	4,369.7
Alaska . . . . .	.4	.5	.5	.4	.4	.5
Hawaii	23.8	24.0	24.0	26.3	23.6	26.7
United States	3,771.1	3,873.2	4,018.1	4,216.1	4,309.9	4,396.9

Source: "Consumption of Commercial Fertilizers in the United States", SPCR7 (10-73) and earlier issues, Crop Reporting Board, SRS, USDA, Nov. 1, 1973.

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