Evaluation of Pesticide Supplies and Demand for 1976

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EVALUATION OF PESTICIDE SUPPLIES AND DEMAND FOR 1976. By Paul A. Andrilenas and Theodore R. Eichers, Economic Research Service, U.S. Department of Agriculture, Agricultural Economic Report No. 332.

ABSTRACT

Pesticide supplies for 1976 are ample for nearly all products. Pesticide production is up 10 to 15 percent over last year, and supplies have increased even more because of substantial gains in beginning-year inventories. Prices to dealers are up slightly, but prices to growers are steady to a little below last season. With increased capacity and with few production problems anticipated, supplies next year also should be generous. Supply estimates are based on surveys of pesticide producers and distributors. Demand estimates are based on farmers' 1976 planting intentions and data on pesticide use patterns.

KEY WORDS: Pesticide production, pesticide supply, pesticide demand, pesticide outlook.

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PREFACE

This is the second pesticide supply-demand evaluation report prepared by the Economic Research Service. The first report was published in 1975 because of supply shortages resulting from production problems in 1974 and early 1975. Critical pesticide shortages at that time demonstrated the continuing need by manufacturers, distributors, growers, and policymakers for comprehensive pesticide situation and outlook information.

The authors wish to express their appreciation to the staff of the Statistical Reporting Service and to persons in the pesticide industry who assisted in developing the survey schedule. Appreciation is also expressed to the pesticide producers and distributors that provided information for this study.

The use of trade names in this report is for identification only and does not constitute endorsement of such products or imply discrimination against other similar products.

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SUMMARY

Supply-1976

Pesticide production for 1976 use is expected to be up about 10 to 15 percent over last year. Herbicide production is likely to increase about 14 percent and insecticide production about 15 percent. Fungicide production is likely to be unchanged.

Raw material shortages have virtually disappeared. Less than 10 percent of the basic pesticide producers reported any production difficulties. The few reported shortages were attributed to inadequate capacity.

Exports account for a substantial share, between one-fourth and one-third, of U.S. pesticide production. In 1974 about half of the fungicides and insecticides and 15 to 20 percent of the herbicides were exported.

Production facilities were operating at close to capacity in 1975, especially for corn, soybean, and small grain herbicides. Substantial new capacity on stream for 1976 is increasing overall capacity by about 20 percent. Herbicide facilities are operating at nearly 90 percent of capacity for 1976.

Pesticide supplies are likely to total 15 to 20 percent over last year. This is the result of a 10- to 15-percent increase in production and substantially greater inventory carryovers. Insecticide supplies are about 30 percent over last year. Herbicide supplies are up 15 to 20 percent, but fungicide supplies are nearly unchanged.

Demand-1976

Pesticide demand in 1976 is expected to be 5 to 10 percent over a year ago. Demand for cotton herbicides and insecticides is expected to be up 20 percent. Corn herbicide demand is likely to be about 6 percent greater than in 1975.

Changes in use patterns are apparent because of the constant introduction of new pesticides. Products rapidly increasing in use are mostly herbicides such as atrazine, alachlor, and trifluralin. Products decreasing most rapidly in use are organochlorine insecticides.

Pesticide prices for 1976 are basically unchanged from a year ago. Producer prices to distributors are reported to be up 5 to 10 percent over last year. But retail list prices have increased less than 5 percent and prices paid by growers are reported to be down slightly.

Pesticide regulations are increasingly important in planning pest control programs. Important among last year's regulatory activities were the extension of the pesticide control act, Federal Insecticide, Fungicide and Rodenticide Act (FIFRA), as amended, by Congress, and the suspension of certain uses of chlordane and heptachlor by the Environmental Protection Agency (EPA). During the next 18 months growers intending to use "restricted use pesticides" must be certified by EPA.

Early season sales are off substantially from the same periods in 1974 and 1975, but total sales for the season are expected to be up 10 percent over 1975.

Supply-demand balance-1976

Expanded crop acreage is expected to increase demand for pesticides in 1976. According to farmers' intentions, cotton acreage will be up substantially (about 20 percent) with more modest increases for corn, sorghum and wheat. As a result, total pesticide demand is expected to rise by 5 to 10 percent over last year. Supplies, up 15 to 20 percent, should be ample.

Demand for herbicides is expected to be up about the same as overall pesticide demand. Although the demand for cotton herbicides is projected to be 20 percent over 1975, supplies are up about 25 percent. Corn herbicide demand is estimated to be about 6 percent greater than last year, with supplies up about 11 percent. Soybean herbicide supplies should exceed demand by about 20 percent.

Insecticide demand should be up from 1975 levels largely because of increased cotton acreage. However, overall supplies of insecticides are expected to be adequate. Production is up more than 15 percent and beginning inventories were high compared with last year.

Demand for other pesticides will increase because of larger cotton acreage on which substantial amounts of defoliants and desiccants are used. Supplies of other pesticides should be adequate because of substantial inventory carryovers.

Outlook for 1977 to 1980

Prospects for 1977 indicate that agricultural pesticide supplies should be adequate. Manufacturers are adding production facilities and there is some unused capacity. Plans to increase capacity 10 to 15 percent for 1976 and 5 to 10 percent for 1977 have been reported.

Prospects for 1978 to 1980 indicate a slower growth rate in pesticide production and use than in recent years. A substantial share of the corn, soybean, cotton, and spring wheat acreage, 80 to 90 percent, is now treated with herbicides. Expanding acreage for these crops was a major factor in the rapid recent growth. But a number of trends in use patterns, such as using mixtures rather than single ingredients, more broadcast versus band application, and greater use of minimum tillage, will tend to increase application rates.

EVALUATION OF PESTICIDE SUPPLIES AND DEMAND FOR 1976

by

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INTRODUCTION

Following 2 years of frequent pesticide shortages, the pesticide supply-demand situation has returned to normal. Pesticide production problems due to raw material shortages and the energy crisis have virtually disappeared. The importance of pesticides as a tool in agricultural production continues to grow. More acres are being treated as farmers attempt to meet an increasing demand for agricultural products. Also, uses of new products and some older products are being expanded to obtain more effective pest control.

This study reports on pesticide production, the factors affecting pesticide supply and demand in 1976, and the outlook for 1977 to 1980. The production and supply sections of this report are based on data obtained from 25 basic pesticide producers which account for about two-thirds of the farm pesticides used. Regional pesticide distributors serving most of the United States were also contacted for information on pesticide distribution and local availability. The demand sections are based on 1976 farmer planting intentions and available data on proportions of acres treated and rates of application.

PESTICIDE PRODUCTION AND SUPPLY

The farm pesticide supply situation for 1976 is generally favorable. Net supplies are expected to be 15 to 20 percent over 1975. Pesticide production for use in 1976 is expected to be 10 to 15 percent over last year (table 1). Herbicide production is expected to be up 14 percent and insecticide production 15 percent over last year. But fungicide production will probably be about the same as a year ago. In addition, inventory carryovers for use in 1976 are substantially larger than they were last year. The carryover to 1976 averaged 13 percent of the previous year's production compared with 8 percent in 1975. Herbicide inventory carryovers are up 40 percent over last year, and insecticide and fungicide beginning stocks were more than double those at the start of the 1975 season.

Exports account for a substantial share of the pesticides produced in the United States. This share remains fairly constant at between one-fourth and one-third of total sales. In 1974, 31 percent of the pesticide dollar sales went to export markets. Fifty-seven percent of the fungicides, 44 percent of the insecticides, and 17 percent of the herbicides were exported that year.

Pesticide production problems such as were experienced in 1974 and early 1975 were due to raw material shortages and the energy crisis, but have virtually disappeared. Less than 10 percent of the pesticide producers responding to an ERS survey reported any production difficulties this season. These firms attributed their production difficulties to inadequate capacity. This compares with 72 percent of the producers reporting product shortfalls because of inadequate quantities of raw materials in 1974 and 40 percent in early 1975.

Table 1--Estimated pesticide production, inventories, and prices for basic pesticide producers, 1973 to 1976 1/

Item	Fungicides	Herbicides	Insecticides	All pesticides
		Percent		
Production (expected 1976 as a percent of 1975)	2/	114	115	112
Inventory carryover (percent of production):				
1975	22	10	22	13
1974	9	7	9	8
1973	--	--	--	14
Prices received (percent of previous year):				
1976	105	106	105	106
1975	--	--	--	123
1974	--	--	--	125
Net supply (1976 percent of 1975)	103	117	128	117

1/ Based on a survey of 25 basic pesticide producers conducted in January and February 1976.
2/ Blanks indicate data not available.

Pesticide Production Capacity

Most producers of major pesticide products were operating at or near effective capacity in 1975. Producers responding to the ERS survey reported average pesticide output at 84 percent of capacity (table 2). A number of smaller producers, however, were operating at only 50 or 60 percent of capacity. Herbicide plants were operating at more than 90 percent of capacity, while insecticide plants were operating at 70 to 80 percent of capacity.

Substantial new herbicide capacity (an increase of nearly 20 percent) is on stream or expected to be on stream for the 1976 season. Thus, herbicide capacity should not be pressed quite as much as in 1975. Herbicide facilities are expected to operate at 88 percent of capacity in 1976 compared with 92 percent in 1975. Insecticide capacity is expected to be up only 2 percent and fungicide capacity will be unchanged for 1976.

Herbicide capacity was especially tight for corn, soybean, and small grain pesticide products in 1975. Small grain herbicide facilities were reported operating at 99 percent of capacity in 1975, but with a slight increase in capacity these facilities are expected to be operating at 94 percent of capacity in 1976. Corn and soybean facilities were reported operating at 93 percent of capacity in 1975. In spite of a 30-percent capacity increase for 1976, facilities for producing corn and soybean herbicides are still expected to be operating at 88 percent of capacity this year.

Fungicide and insecticide capacity is relatively unchanged for 1976. As a result, these facilities should be operating more nearly at capacity than last year. Facilities for producing cotton and corn insecticides in 1976 are expected to be operating at 96 and 90 percent of capacity, respectively, compared with 73 and 83 percent of capacity in 1975.

Distribution

To assess the forces that are affecting pesticide demand, regional distributors serving most agricultural areas of the United States were contacted for pesticide market information. Their reactions to questions about price, purchase patterns, and inventories give some indication of the impact these factors are having on the demand for pesticides.

The surveyed distributors sell primarily to retail farm supply dealers and a few large growers. In 1975 these firms' sales averaged about $20 million. In 1976 they expected sales to rise about 10 percent. Most of their sales were for farm use, 95 percent or more. Herbicides were the major type of pesticide sold by these firms, accounting for about 60 percent of total sales. Insecticides accounted for about 20 percent, fungicides for nearly 15 percent, and other pesticides about 5 percent of sales (table 3).

Distributor inventories at the start of the 1976 sales season were back to normal. Beginning 1976 inventories were about 11 percent of annual sales volume compared with only 5 percent at the start of the 1975 season. Most suppliers were aggressively selling products, and shortages of only a few items

Table 2--Pesticide production capacity utilization in 1975, expected 1976, and expansion plans for 1976 and 1977-78 1/

Type of pesticide	Production as a percentage of capacity		Capacity expansion plans, percentage change	
	1975	Expected 1976	1975 to 1976	1976 to 1977-78
	Percent			
Fungicides	93	93	0	5
Herbicides:				
Corn and soybeans	93	88	30	4
Small grains 2/	99	94	6	4
Cotton	76	75	0	26
Other	67	45	0	0
Total	92	88	19	7
Insecticides:				
Cotton	73	96	0	3
Corn	83	90	4	9
Other crops	79	54	7	0
Livestock	46	50	0	0
Total	74	86	2	3
All pesticides	84	87	12	7

1/ Based on a survey of 25 basic pesticide producers conducted in January and February 1976.
2/ Includes rice.

Table 3--Selected indicators of pesticide supplies and demand at distributor level, 1974 to 1976 1/

Item	Fungicides	Herbicides	Insecticides	Other pesticides	All pesticides
	Percent				
Sales by type	14	59	22	5	100
Expected sales (1976 as a percent of 1975)	106	111	109	102	110
Inventory carryover (percent of sales):					
1973 to 1974	9	13	11	13	12
1974 to 1975	4	5	5	6	5
1975 to 1976	9	11	11	12	11
Average rise in prices paid to suppliers:					
1973 to 1974	16	13	11	11	12
1974 to 1975	20	21	20	20	20
1975 to 1976	8	8	8	10	8
Suggested retail price as a percent of previous year:					
1975 percent of 1974	--	--	--	--	125
1976 percent of 1975	100	100	108	--	103

1/ Based on replies from seven regional farm supply distributors serving most of the Nation.

were still being reported. In 1974 and 1975 distributors reported shortages of as much as 50 percent or more for 10 to 20 major pesticides. This year they usually mentioned only one or two items as being in short supply. Products reported to be in short supply by some distributors this year include: alachlor, bentazon, EPTC, carbaryl, and liquid formulations of atrazine. All items except carbaryl were reported to be less than 10 percent short of customer demand.

As of mid to late March distributors were reporting sales substantially behind the same periods for 1974 and 1975. With shortages no longer a major

concern, farmers are returning to the more normal practice of purchasing pesticides when needed. As a result, there could be some local shortages during high demand periods because of distribution problems. Distributors still expected total sales for the 1976 season would be up 10 percent over 1975.

Prices

Pesticide price increases to dealers are modest compared with those of the last 2 years. Distributors reported that prices paid to their suppliers for pesticides to be used in 1976 were 5 to 10 percent higher than last year (table 3). Increases, about the same for all types of pesticides, averaged below the 20-percent rise in 1975 and the 12-percent rise in 1974.

Suggested or list retail prices for selected pesticides are reported to be slightly higher (2 to 5 percent) this season compared with the sharp increase of about 25 percent last season. Fungicide and herbicide list prices for 1976 are almost unchanged, but prices for insecticides are up 5 to 10 percent.

While there is a slight rise in retail list prices, distributors reported that growers are paying slightly lower prices than last year, especially for herbicides. Thus, growers are getting some relief from the rather substantial price increases of recent years which averaged about 10 to 20 percent in 1974 and 30 to 40 percent in 1975 (table 4). Farmers reported that price rises in the 2-year period 1973 to 1975 ranged from 20 percent for aldrin to 125 percent for 2,4-D. The average farm price increase for 10 major products during the 2-year period was over 50 percent.

DEMAND

Changes in planted acres of several important crops--corn, cotton, soybeans, wheat, and sorghum--are the most important underlying forces affecting yearly shifts in the demand for pesticides. Other instrumental factors--improved control, lower cost, ease of handling, regulatory action, and changes in pest control practices--also influence the demand for individual pesticides and for all pesticides.

Expanded crop acreage is expected to increase demand for pesticides in 1976. Farmers intend to plant substantially more cotton in 1976 than last year. More modest increases are planned for corn, sorghum, and wheat. Soybean acreage is expected to decline, partially offsetting the added acres of other crops. Demand should be further enhanced by a continuing trend to more intensive use of pesticides, especially herbicides. Based on January planting intentions, the total need for pesticides in 1976 should be more than 5 percent above 1975.

Table 4--Average prices paid by farmers for selected pesticides as reported by USDA, 1973, 1974, and 1975

Pesticide product 1/	Price per pound of active ingredient			Price rise	
	1973	1974	1975	1973 to 1974	1974 to 1975
	Dollars			Percent	
Insecticides:					
Aldrin	1.92	2.00	2.30	4	15
Carbaryl	1.26	1.38	1.74	10	26
Malathion	2.06	2.14	2.70	4	26
Methyl parathion	2/	1.64	2.55	--	55
Parathion	1.65	1.88	2.58	14	37
Toxaphene	.64	.76	.97	19	28
Average	--	--	--	11	31
Herbicides:					
Atrazine	2.88	2.92	3.69	1	26
2,4-D	1.08	1.46	2.43	35	66
2,4,5-T	2.68	3.15	4.30	18	37
Average	--	--	--	18	43
Fungicides:					
Zineb	.95	1.08	1.51	14	40

Source: Agricultural Prices, Statistical Reporting Service, U.S. Dept. Agr., ps 1-3 (75), June 1975, and earlier issues.

1/ Aldrin, 4 pounds per gallon emulsifiable concentrate; carbaryl, 80 percent wettable powder; malathion, 5 pounds per gallon emulsifiable concentrate; methyl parathion, 4 pounds per gallon emulsifiable concentrate; parathion, 4 pounds per gallon emulsifiable concentrate; toxaphene, 6 pounds per gallon emulsifiable concentrate; atrazine, 80 percent wettable powder; 2,4-D, 4 pounds per gallon emulsifiable concentrate; 2,4,5-T, 4 pounds per gallon emulsifiable concentrate; zineb, 75 percent wettable powder.
2/ Blanks indicate data not available.

Pesticide Supply-Demand Balance

Herbicides

Demand for herbicides is likely to be up about the same as the overall increase in pesticide demand. The most important factor contributing to increased herbicide use is the expected expansion in corn and cotton acres. Increases in wheat and sorghum acreage will also add to demand for herbicides. A projected decline in soybean acres will partially offset any increases in herbicide use on cotton.

Also adding to demand is the more intensive use of herbicides. The proportion of planted acres treated with herbicides continues to increase but more slowly. Farmers are using more herbicides by replacing band applications with broadcast treatments, mixing several herbicides to obtain better weed control, and using herbicides to control weeds in no-till plantings and otherwise to replace mechanical cultivations.

Drought conditions in the winter wheat area may increase the demand for herbicides. A portion of the acres on which wheat was destroyed by the drought may be replanted with sorghum, thus adding to the need for sorghum herbicides. Declines in winter wheat production could also encourage farmers in the spring wheat areas to plant more acres, increasing the need for wheat herbicides there.

The estimated 1976 supply of corn herbicides is about 10 percent greater than in 1975 (table 5). This supply should be adequate to meet an expected 6-percent increase in farmers' needs. In addition, distributors and producers will probably end the season with larger inventories of corn herbicides than last year.

Supplies of herbicides used in soybean and wheat production are 10 to 15 percent greater than a year earlier. Soybean herbicide supplies will probably exceed requirements by 20 percent. Wheat herbicides also appear to be ample, with supplies about 8 percent greater than projected requirements.

Although the demand for cotton herbicides will probably be about 20 percent over 1975, supplies are expected to be adequate. Production of cotton herbicides has not increased as much as requirements, but beginning inventories are greater. Supply in 1975 was about the same as in 1974, but a 20-percent drop in demand in 1975 contributed to a large inventory buildup at the end of the 1975 season. In addition, herbicide supplies available for use on cotton should be enhanced by the expected reduction in soybean acreage. Several products are interchangeable between these two crops, contributing to flexibility in utilizing available herbicide supplies.

Insecticides

Demand for insecticides in 1976 should recover from 1975 levels. The largest increases in demand appear to be for those used in cotton production and for soil insect control to replace other products that are losing their effectiveness or are being removed from the market by regulatory action. Again in 1976, as in 1975, changes in cotton acres will be a major factor contributing to changes in farm insecticide use. The sharp decline in cotton

Table 5--Supply-demand balance for herbicides used by farmers, selected crops

Crop	1976 demand as percentage of 1975 demand 1/	1976 supply as percentage of 1975 supply 2/
	Percent	
Corn	106	111
Cotton	120	126
Soybeans	95	115
Wheat	103	111

1/ Based on 1976 farmer planting intentions as reported in "Prospective Plantings", Stat.Rept. Serv., U.S. Dept. Agr. CrPr 2-4, (1-76), and current application rates.
2/ Based on January-February 1976 survey of 25 basic pesticide producers.

Table 6--Supply-demand balance for insecticides used by farmers in corn and cotton production

Crop	1976 demand as percentage of 1975 demand 1/	1976 supply as percentage of 1975 supply 2/
	Percent	
Corn	103	111
Cotton	120	130

1/ Based on 1976 farmer planting intentions as reported in "Prospective Plantings", Stat. Rept. Serv., U.S. Dept. Agr. CrPr 2-4, (1-76), and current application rates.
2/ Based on January-February 1976 survey of 25 basic pesticide producers.

acres in 1975 reduced cotton insecticide requirements, and the substantial increase in planned cotton acreage for 1976 is expected to increase cotton insecticide use by about 20 percent this year (table 6).

Overall insecticide use in corn production will probably be up less than 5 percent. However, some important shifts in the use of particular soil insecticides are expected. There will be less of the organochlorine insecticides used because of regulatory actions and loss of effectiveness. On the other hand, use of alternative products such as carbofuran, phorate, and fonofos should continue to increase. Supplies of cotton and corn insecticides are up about 30 and 10 percent, respectively (table 6).

Other pesticides

Use of other pesticides--fungicides, defoliants and desiccants, growth regulators, miticides, and fumigants--is affected primarily by plantings. With the increase in cotton acres, the demand for defoliants and desiccants will most likely increase substantially. Use of fungicides is also likely to be up somewhat from 1975. More growth regulators are being used and this trend will continue to add to the volume of other pesticides used.

Supplies of other pesticides are expected to be adequate. Fungicide production is unchanged, but larger inventories, more than double a year ago, are contributing to a greater supply.

Change in Pesticide Purchase Patterns

The pesticide industry is very volatile, with new products being introduced and old ones being discontinued. To assess changes in purchase patterns, distributors were asked to report on products for which sales had increased most and those for which sales had decreased most between 1971 and 1975. They were also asked to report reasons for these changes.

Reasons most often reported for rapid increases in use were improved control, increased acreage, lower control cost, and ease of handling. Factors contributing to rapid decreases in use were EPA cancellations and suspensions, availability of better products, and reduction of crop acreages on which the pesticides were used.

Herbicides were most evident among the products increasing rapidly in use (table 7). Eight of the 10 products distributors identified as rapidly increasing were herbicides, with increases in sales during the 4-year period ranging from 40 to 400 percent. These included atrazine, alachlor, trifluralin, alanap, butylate, benefin and barban. Atrazine was mentioned most frequently, especially the liquid formulations which were replacing wettable powders. Alachlor, whose major attraction is that it can be used on corn and soybeans, was also mentioned several times among the products for which sales were increasing rapidly.

EPA cancellation and suspension actions were the major factors affecting changes in insecticide use. Insecticide products with sales increasing rapidly were soil insecticides that were replacing aldrin. Products on the

Table 7--Pesticide products reported by distributors to be increasing and decreasing most rapidly in use between 1971 and 1975 1/

Products increasing most rapidly	Products decreasing most rapidly
Herbicides	Herbicides
Alachlor	Atrazine (wettable powder formulations)
Atrazine (liquid)	
Alanap	
Benefin	Insecticides
Butylate	
Barban	Aldrin
Cyanazine	Carbaryl (not always available)
Trifluralin	Dieldrin
Insecticides	
Carbofuran	Fungicides
Fonofos	
	Mercury

1/ Based on replies from seven regional farm supply distributors serving most of the Nation.

decline were mostly those which suffered from reduced effectiveness and EPA cancellations and suspensions. These included aldrin, dieldrin, and DDT.

A number of fungicides were also reported to be decreasing in importance. These included mercury seed treatments. Also among the decreased fungicide products were some of the newer synthetic organics.

Pesticide Regulations

Pesticide regulations are an increasingly important factor that growers must consider in planning their pest control programs. As indicated earlier, regulations have contributed substantially to changes in the use of several pesticide products.

Probably the most significant regulatory events in 1975 were: (1) The extension of the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA) Amended (legislation authorizing pesticide regulation), and (2) The suspension of certain uses of chlordane and heptachlor.

Congress extended FIFRA Amended for 2 years to September 30, 1977. However, in extending the act, Congress incorporated a number of amendments and requirements. Among the most significant of these were: (1) The Administrator of EPA is required to provide the Secretary of Agriculture with copies of proposed changes in pesticide classification or cancellation action 60 days prior to publication. The Secretary's response and EPA's reply to his response, are to be published in the Federal Register; (2) The Administrator of EPA is authorized to consider the completion of a certification form as fulfillment of the private applicator certification provision. The Administrator may require the applicator to complete an EPA-approved training program, but the Administrator may not require the applicator to pass an examination. Certification will be required for persons who apply certain restricted use pesticides that are considered personally or environmentally hazardous; and (3) EPA is required to assess the impact of proposed changes in classification or cancellations on production and price of agricultural commodities, retail food prices, and other effects on the agricultural economy.

On December 24, 1975, EPA suspended the production of chlordane and heptachlor for most uses. The ruling permitted continued use of chlordane for underground termite control, and for fire ant and Japanese beetle control in specified quarantine programs, and several other uses in some localities. Use on corn is also permitted until August 1, 1976. The suspension ruling has been appealed and cancellation hearings which were interrupted when suspension proceedings started are expected to resume.

For the near future, probably the most significant regulatory requirement is the final implementation of FIFRA, as amended in 1972. All aspects of the new act are to be in force by October 1977. By this time all private applicators must be certified and all pesticides that were registered before 1972 must be re-registered. If currently registered products fail to meet re-registration standards set under the authority of the current act, cancellation notices must be issued by October 1977.

OUTLOOK FOR 1977 TO 1980

For the remainder of the 1970's, continued but slower growth in the pesticide market is anticipated. Pesticide regulatory activities and alternative pest control programs will become increasingly important in farmers' pest control efforts.

Prospects for 1977

Prospects are good that supplies of agricultural pesticides will be adequate for the 1977 crop season. Manufacturers of agricultural pesticides are adding to capacity and have some current unused capacity. In 1975 pesticide producers indicated they were using about 90 percent of their available herbi-

cide capacity and about 80 percent of the available insecticide capacity.

Production capacity is expected to be up for the 1977 crop season. Reporting firms indicated that they expected to increase herbicide capacity by about 20 percent and insecticide capacity by nearly 5 percent. Fifty percent of the firms reporting herbicide production said they planned to expand production in 1976 or 1977.

Prospects for 1978 to 1980

Projections concerning expansions beyond 1977 are sketchy. Additional capacity increases are projected for 1978, mostly for fungicides and herbicides.

For the future, slower growth than in the last 10 years can be expected. About 80 to 90 percent of the corn, cotton, soybean and spring wheat acreage is now treated with herbicides. Thus, further growth in the big markets is likely to be less rapid. However, intensified use practices, introduced or expanded in recent years, are likely to result in some additional growth.

During the last 10 years overall production of synthetic organic pesticides nearly doubled and herbicide production almost tripled (table 8). Thus, herbicides accounted for a major share of the increase. The growth rate was considerably greater from 1964 to 1969 than from 1969 to 1974. This was true for all types of pesticides. The average annual growth rate from 1964 to 1969 was about 8 percent, but only 5 percent from 1969 to 1974. The growth rate for herbicides was about 15 percent per year in the first half of the period and 11 percent in the second half.

The rapid growth in pesticide use is reflected in increased costs of pest control. When allocating pesticide costs over all acres grown for selected crops, pest control costs per harvested acre doubled between 1966 and 1974 for cotton and increased 9 times for corn. An average of about $1 was spent for each acre of corn grown in 1966 (table 9). By 1974 it had jumped to $9. Pest control costs in 1974 for field crops were highest for peanuts, averaging nearly $50 an acre for all acres grown.

The substantial increases in costs for pest control between 1966 and 1974 can be attributed to treating a larger share of the acreage and to higher costs of materials. Crop acres treated with pesticides have increased by more than 50 percent since 1966. The substantial increase in herbicide use has been particularly important in the increasing number of acres being treated with pesticides.

Increases in pesticide use similar to those in the last 10 years are not likely. Pest control costs are expected to continue to rise, but more gradually. The high percentage of crop acreage treated implies that there is not enough untreated acreage left to sustain earlier growth rates. However, some growth is anticipated as new products are introduced to supplement existing products or to provide pest control not now being achieved. Higher prices of pesticides will add to the cost of pest control. Price increases are likely because of higher production, developmental, and registration costs.

Table 8--Synthetic organic pesticide production

Type of pesticide	Production			Annual change	
	1964	1969	1974	1964-1969	1969-1974
	Million pounds			Percent	
Fungicides	113	141	163	5.0	3.1
Herbicides	226	393	604	14.6	10.7
Insecticides and other	444	570	650	5.7	2.8
Total	783	1,104	1,417	8.2	5.0

Source: United States Production and Sales of Pesticides and Related Products, 1974, and Synthetic Organic Chemicals, United States Production and Sales, 1964, United States International Trade Commission, November 1975 and November 1965.

Table 9--Trends in total pest control costs per acre for selected crops (Costs allocated over all acres grown)

Crop	Pest control cost per acre		
	1966	1971	1974
	Dollars		
Cotton	11.07	10.86	23.62
Corn	1.08	4.39	8.97
Grain sorghum	1.64	1.86	4.57
Barley	1/	--	1.33
Winter wheat	.18	.38	--
Durum wheat	.18	.38	1.15
Other spring	--	--	--
Soybeans	1.22	3.17	6.83
Peanuts	7.73	25.80	49.69

Source: Costs of Producing Selected Crops in the United States - 1974, Committee on Agriculture and Forestry, United States Senate, January 8, 1976.

1/ Blanks indicate data not available.

On the other hand, greater reliance on integrated pest control, pest management programs, and improved application techniques will help to limit pesticide use. The future holds promise for replacing much chemical pest control with biological methods. However, major impacts of current research probably will not be felt for several years.

This publication reports research involving pesticides. It does not contain recommendations for their use, nor does it imply that the uses discussed here have been registered. All uses of pesticides must be registered by appropriate State and/or Federal agencies before they can be recommended.

CAUTION: Pesticides can be injurious to humans, domestic animals, desirable plants, and fish or other wildlife -- if they are not handled or applied properly. Use all pesticides selectively and carefully. Follow recommended practices for the disposal of surplus pesticides and pesticide containers.