value of crops produced in column one. The $14 million increase in value of farm production results in an additional $18 million increase in sales in the economy —yielding a total expansion of $32 million. The total also includes accounting for the decrease in dryland farming.

Sectoral effects

This framework of analysis permits detailed examination of the sources and the consequences of change. For example, it can be shown how much the increase in almonds or tomatoes, or some other crop, will cause the sales in each sector of the economy to increase. Each multiplier used in table 1 is really the sum of a set of multipliers, one set for each sector. This set of multipliers can be used to show how much a change in sales of any one crop will cause changes in sales in each of the other sectors of Colusa County's economy. Because of space limitations, only two crops, almonds and tomatoes, are shown (table 2).

Because the analysis provides individual sector multipliers, the Board of Supervisors and individual citizens can use it to evaluate any number of changes they may wish to consider. County groups or individual citizens can make assumptions about changes different from those discussed in the report. By using the individual multipliers, as shown above, they can estimate the pattern of sales change that would be produced by their assumptions. This type of analysis, showing the results of expected or hypothetical sales (or land use) changes, is useful in weighing and deciding on alternative county resource use policies.

Wider application

Recently, Professor Leontief of Harvard University received the Nobel Prize in economics for his work in developing input-output analysis for local, national and international use. The work reported here is based on his pioneering efforts. It was possible to respond quickly to the Colusa request because of experience gained from work on previous studies. Economic analysis with input-output permits better use of the knowledge and experience of the local Cooperative Extension staff. Thus, applications such as this one better equip the university-based and county-based extension personnel to provide local units of government valuable information for resource use decision making.

An input-output analysis can also be used for evaluating a vast assortment of economic changes, for example, the estimation of the impact of a new or expanded manufacturing firm, a hospital, a school, or a logging operation. It can also handle actual or assumed decreases in economic activity.

It should be emphasized, however, that input-output analysis is only one tool for appraising economic change. However valuable it is, it is not a substitute for all other information and analysis, nor for common sense. It allows for alternative resource use decisions to be compared on a quantitative basis. By so doing, it uses local information to facilitate economic planning.

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TABLE 2. ANALYSIS OF ADDITIONAL SALES CAUSED BY INCREASED ALMOND AND TOMATO SALES, COLUSA COUNTY

	Sector*	Multiplier	Increase in sales resulting from the $1,427,400 increased almond production	Multiplier	Increase in sales resulting from the $3,134,200 increased tomato production
1	Mining	.0110	$ 15,700	.0100	$ 31,300
2	Construction	.0083	11,800	.0091	28,400
10	Furniture	.0055	7,900	.0072	22,600
11	Printing and publishing	.0068	9,700	.0107	33,500
12	Chemicals	.0135	19,300	.0155	48,600
13	Primary metals	.0042	6,000	.0050	15,600
14	Fabricated metals	.0130	18,500	.0170	53,400
15	Transportation	.0058	8,300	.0062	19,500
16	Communication	.0064	9,100	.0085	26,600
17	Utilities	.1176	167,900	.1044	327,200
18	Trade	.1445	206,300	.1406	440,800
19	Finance	.1039	148,300	.1275	399,600
20	Services	.1045	149,200	.1725	540,100
21	Households	.5025	717,300	.6210	1,946,300
29	Tomatoes			1.0000	3,134,200
32	Almonds	1.0000	1,427,400		
	Total	2.0476	$2,922,700	2.2553	$7,068,400

* Those sectors with zero or near-zero increases are excluded.

Controlling ... in

POWDERY MILDEW OF ROSE, caused by the fungus, *Sphaerotheca pannosa*, results in unsightly leaves and flowers, and may reduce growth. Several new fungicides were evaluated for the control of powdery mildew in southern California rose gardens, and are reported here.

Spring trial—1972

Rose plants of several breeding lines obtained through the courtesy of Armstrong Nursery, Ontario, were used for the treatments. Each treatment was replicated four times, using 15 rose plants per replicate. Powdery mildew was present in the plots before application of the first spray.

Fungicide treatments with rates of materials per 100 gallons of water were: Eli Lilly 273 7.2%, 50 ppm; Afugan 30%, 6 oz; Triforine 20%, 10 oz; and Benlate 50W, 8 oz. Sprays were applied to runoff with a 2-gallon pressurized Hudson sprayer at 40 psi. Applications were made on April 4, 18, May 1, 16 and 30 (an approximate 14-day spray schedule). Disease symptoms were rated on a scale of 0 to 4 on June 19—a "0" rating indicating no disease symptoms, while a "4" rating indicated mildew completely covering both sides of the leaves and numerous mildew colonies on petiole and stem. Results of this trial are shown in table 1. Applications of El 273 and

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POWDERY MILDEW

OUTDOOR ROSES

The experimental fungicide El 273 provided excellent control of rose powdery mildew when applied in these tests on a 14-day spray schedule when mildew was severe before spray applications began. (Unfortunately, El 273 will not be marketed by the manufacturer.) Triforine gave good control with data from these and previous trials suggesting applications before appearance of rose powdery mildew, and on a nine-day spray schedule.

Afugan on a 14-day spray schedule gave significantly better control than all other materials tested. Triforine provided intermediate control and was significantly better than either Benlate or the check treatment.

9-spray schedule—1972

Since Triforine provided intermediate control when applied on a 14-day spray schedule, a trial was initiated to compare Triforine and El 273 for control of rose powdery mildew when sprays were applied on a 9-day spray schedule.

Fungicides and rates per 100 gallons of water were as follows: El 273 7.2%, 50ppm; and Triforine 20%, 10 oz. Sprays were applied on May 10, 19, 28 and June 8. The plot was divided into seven replications with each replicate consisting of a different rose variety and including Firelight, Fashion, Eutin, Garden Party, President Hoover, Show Girl and Blaze. Twenty-five rose plants were included in each replication. Applications were applied as in the previous trial. Disease ratings taken on June 19 are shown in table 2. El 273 provided significantly better control than Triforine when sprays were applied on a nine-day spray schedule. Powdery mildew was severe before start of the spray applications and Triforine gave good control under those conditions. No phytotoxicity was noted from either material during the experiment.

Spring trial—1973

Several new systemic fungicides became available during 1973 and plots were established at the Howard Rose Company, Hemet. Powdery mildew was severe in the plot before application of any of the fungicides.

Susceptible rose varieties Garden Party, Show Girl, and Fashion were used in this trial. Each rose variety was used for two replications with six replications in the experiment. Plots were 20 ft long with approximately 20 rose plants per replication. Treatments and rates per 100 gallons of water were: El 273 7.2%, 50ppm; Benlate 50W, 1 lb + 4 oz B1956; RH 3928 50W, 1 lb + 4 oz B1956; and Bay Dam 18654 50W, 1 lb. Sprays were applied as previously (on April 30, May 9, 18 and 25).

In this trial, disease was rated on a scale of "0" to "4" with a 4 rating indicating leaves completely covered with powdery mildew. Results of this trial are shown in table 3. El 273 was significantly better than all other materials tested for the control of rose powdery mildew. Benlate and RH 3928 provided intermediate control and was significantly better than Bay Dam or the check treatment.

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TABLE 1. COMPARISON OF FUNGICIDES FOR THE CONTROL OF ROSE POWDERY MILDEW, ONTARIO, SPRING, 1972

Treatment	Disease rating June 19
El 273, 50 ppm	0.5* a
Afugan 30%, 6 oz.	0.9 ab
Triforine 20%, 10 oz.	1.5 bc
Benlate 50W, 8 oz.	1.9 c
Check or no treatment	1.9 c

* Significant 5% level. Treatments with same letter are not significantly different from each other.

TABLE 2. COMPARISON OF TRIFORINE AND EL 273 FOR CONTROL OF ROSE POWDERY MILDEW WHEN SPRAYS APPLIED EVERY 9 DAYS, HEMET

Treatment	Disease rating June 19
El 273 7.2%, 50ppm	0.6* a
Triforine 20%, 10 oz.	1.4 b
Check or no treatment	2.9 c

* Significant 5% level. Treatments with different letters are significantly different from each other.

TABLE 3. COMPARISON OF SEVERAL FUNGICIDES FOR CONTROL OF ROSE POWDERY MILDEW, HEMET, SPRING 1973

Treatment	Disease rating May 29
El 273 7.2%, 50ppm	1.6* a
Benlate 50W, 1 lb + 4 oz B1956	2.8 b
RH 3928 50W, 1 lb + 4 oz B1956	3.2 b
Bay Dam 18654 50W, 1 lb	3.7 c
Check or no treatment	4.0 c

* Significant 5% level. Treatments with different letters are significantly different from each other.