

Alfalfa - Bromegrass - Orchardgrass Blend: The stand is less dense than that in the other plots. There is much encroachment of sweet clover, white and yellow. Bloat has not been a problem here, probably because the alfalfa in the stand is limited and pasturing has been delayed until plants are mature or dormant. Plants in all plots have been used for pasture during the winter and early spring in this test.

Agri-File Field Crops 232.10

Cost of Producing Forage and Grain in Arizona

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Alfalfa hay production in Arizona is concentrated in two counties--Maricopa and Yuma--where 78 percent of the crop was produced in 1977 (see Table 1). In 1977 Arizona produced 1.365 million tons of alfalfa hay on 210,000 acres for an average yield of 6.5 tons per acre. Comparing 1977 data with that for the 1972-76 period average, acreage remained stable and the yield per acre increased slightly from 6.4 tons to 6.5 tons.

Wheat production is concentrated in Maricopa, Pinal, and Yuma Counties where 89 percent of the 1977 crop was produced. Arizona produced 302,400 tons of wheat in 1977 on 140,000 acres with an average yield of 2.16 tons per acre. Compared with 1972-76 five year average, 1977 Arizona wheat acreage declined 44 percent.

Maricopa and Pinal Counties are the principal producers of barley, producing 75 percent of the total crop in 1977. Total production in 1977 was 100,320 tons on 55,000 acres with an average yield of 1.83 tons per acre. Barley acreage in 1977 was down 29 percent from the 1972-76 average.

Sorghum grain is produced primarily in Cochise, Graham, Maricopa and Yuma Counties where 90 percent of the 1977 crop was produced. Arizona produced 201,600 tons of grain sorghum in 1977 on 90,000 acres with an average yield of 2.24 tons per acre. Compared to the 1972-76 average, the acreage devoted to grain sorghum declined 17 percent in 1977.

Although corn is produced in several counties with Cochise County as the principal producer, it ranks fourth in order of production below wheat, sorghum, and barley.

The profit contribution margin (sales less the variable expenses of production) was sufficient to cover all overhead expenses of 1978 alfalfa hay production and to return a profit of \$7.00 and \$6.25 per ton in Pima and Yuma Counties, respectively (see Table 2). In the other counties, the profit contribution margin was positive (greater than zero) but fell short of covering all overhead expenses of production.

Yuma County was the only county where 1978 wheat produced a profit (see Table 3). In all other counties considered, the profit contribution margin was greater than zero but not sufficiently large to cover all overhead expenses of production.

In the case of 1978 sorghum grain production the story is the same as for wheat. Yuma County showed a profit while the other counties did not (see Table 4). Again, the profit contribution margin was not large enough to cover all of the overhead expenses of production.

In a majority of the cases alfalfa and grain crops are grown in a crop mix containing cotton. As long as the profit contribution margin is positive and greater than zero the grower will make more profit from the crop mix by including the hay or grain crop in the crop mix, even though the enterprise itself does not show a profit. From observation, it appears that Arizona growers are well aware of this economic axiom and that they also put it into practice.

Table 1. Forage and Grain Production in Arizona, 1972-77

Crop	Cochise	Graham	Maricopa	Pima	Pinal	Yuma	Other ^{1/}	Arizona
1972-76 Average Production (tons)								
Alfalfa hay	50,000	39,282	625,920	11,700	92,520	462,480	67,298	1,349,200
Wheat	75,868	8,102	165,150	17,178	115,166	139,478	4,038	524,980
Barley	6,614	10,414	63,002	8,446	40,362	7,242	1,220	137,300
Sorghum	95,762	45,444	40,162	10,474	14,964	13,092	2,540	222,438
Corn	7,496	302	2,820	126	42	1,630	5,666	18,082
1977 Production (tons)								
Alfalfa hay	65,000	48,000	662,400	15,000	97,500	408,000	69,100	1,365,000
Wheat	10,180	4,950	96,120	13,230	106,050	67,710	4,160	302,400
Barley	1,250	4,490	48,240	3,460	36,480	5,040	1,360	100,320
Sorghum	48,160	38,830	52,680	4,880	12,300	40,940	3,810	201,600
Corn	72,270	3,780	-	-	-	590	7,360	84,000

^{1/} Principally Apache, Navajo, and Yavapai Counties

Source: 1977 Arizona Agricultural Statistics

Table 2. Projected 1978 Alfalfa Hay Production Costs and Returns in Selected Counties in Arizona

Item	Cochise	Graham	Maricopa	Pima	Pinal	Yuma
Seedbed preparation	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0
Planting and cultivating	\$ 1	\$ 0	\$ 5	\$ 0	\$ 4	\$ 16
Crop irrigation	\$ 250	\$ 95	\$ 109	\$ 96	\$ 235	\$ 51
Chemicals and application	\$ 7	\$ 0	\$ 44	\$ 0	\$ 12	\$ 49
Harvest - post harvest	\$ 71	\$ 131	\$ 168	\$ 91	\$ 161	\$ 140
Overhead	\$ 118	\$ 145	\$ 167	\$ 130	\$ 99	\$ 174
Total cost per acre	\$ 447	\$ 371	\$ 493	\$ 318	\$ 511	\$ 430
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Yield, tons per acre (1977)	6.5	6.0	7.4	6.0	6.5	8.0
Break-even cost per ton	\$ 68.77	\$ 61.83	\$ 66.62	\$ 53.00	\$ 78.62	\$ 53.75
Market price per ton	\$ 60.00	\$ 60.00	\$ 66.00 ^{a/}	\$ 60.00	\$ 66.00 ^{a/}	\$ 60.00
Profit per ton ^{1/}	\$ -8.77	\$ -1.83	\$ -.62	\$ 7.00	\$ -12.62	\$ 6.25
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Gross receipts per acre	\$ 390.00	\$ 360.00	\$ 488.40	\$ 360.00	\$ 429.00	\$ 480.00
Variable cost per acre	\$ 228.90	\$ 136.77	\$ 332.27	\$ 155.98	\$ 342.40	\$ 201.94
Profit contribution margin ^{2/}	\$ 161.10	\$ 223.23	\$ 156.13	\$ 204.04	\$ 86.60	\$ 278.06
Water cost per acre	\$ 207.30 ^{b/}	\$ 69.51 ^{c/}	\$ 70.84 ^{d/}	\$ 84.00 ^{e/}	\$ 212.00 ^{b/}	\$ 31.88 ^{f/}
Water cost per acre foot	\$ 34.55	\$ 9.93	\$ 11.33	\$ 14.00	\$ 33.92	\$ 4.50

1/ Profit per tons equals market price less the break-even cost per ton.

2/ Profit contribution margin equals gross receipts from an acre less the variable expenses of producing that acre.

a/ Alfalfa cubes.

b/ Pump water.

c/ Water is a combination of surface and pump water.

d/ Water supplied by the Salt River Project.

e/ Water supplied by the Cortara Water Users Association.

f/ Surface water from Colorado River.

Source: Yield data compiled from 1977 Arizona Agricultural Statistics

Cost data compiled from 1978 field crop budgets for the counties considered.

Table 3. Projected Wheat Production Costs and Returns in Selected Counties in Arizona, 1978

Item	Cochise	Graham	Maricopa	Pima	Pinal	Yuma
Seedbed preparation	\$ 17	\$ 10	\$ 14	\$ 9	\$ 9	\$ 12
Planting and cultivating	\$ 21	\$ 56	\$ 17	\$ 19	\$ 28	\$ 17
Crop irrigation	\$ 146	\$ 59	\$ 54	\$ 55	\$ 120	\$ 25
Chemicals and application	\$ 33	\$ 11	\$ 61	\$ 26	\$ 35	\$ 29
Harvest - post harvest	\$ 29	\$ 47	\$ 37	\$ 36	\$ 40	\$ 33
Overhead	\$ 45	\$ 55	\$ 106	\$ 84	\$ 34	\$ 64
Total cost per acre	\$ 291	\$ 238	\$ 289	\$ 229	\$ 266	\$ 180
Yield, tons per acre (1977)	2.00	1.98	2.16	2.28	2.10	2.34
Break-even cost per ton	\$145.50	120.20	\$133.80	100.44	126.67	\$ 76.92
Market price per ton	\$ 95.00	95.00	95.00	95.00	95.00	95.00
Profit per ton ^{1/}	\$-50.50	-25.20	-38.80	-5.44	-31.67	-18.08
Gross receipts per acre	\$190.00	188.10	205.20	216.60	199.50	222.30
Variable cost per acre	\$185.32	136.75	166.41	141.75	175.39	96.47
Profit contribution margin ^{2/}	\$ 4.68	51.35	38.79	74.85	24.11	125.83
Water cost per acre	\$126.68 ^{b/}	41.38 ^{c/}	34.33 ^{d/}	46.67 ^{e/}	107.41 ^{b/}	14.63 ^{f/}
Water cost per acre foot	\$ 34.55	9.93	10.84	14.00	33.92	4.50

^{1/} Profit per tons equals market price less the break-even cost per ton.

^{2/} Profit contribution margin equals gross receipts from an acre less the variable expenses of producing that acre.

^{b/} Pump water.

^{c/} Water is a combination of surface and pump water.

^{d/} Water supplied by the Salt River Project.

^{e/} Water supplied by the Cortara Water Users Association.

^{f/} Surface water from Colorado River.

Source: Yield data compiled from 1977 Arizona Agricultural Statistics

Cost data compiled from 1978 field crop budgets for the counties considered.

Table 4. Projected Sorghum Production Costs and Returns in Selected Counties in Arizona, 1978

Item	Cochise	Graham	Maricopa	Pima	Pinal	Yuma
Seeded preparation	\$ 22	\$ 23	\$ 19	\$ 9	\$ 13	\$ 8
Planting and cultivating	\$ 17	\$ 55	\$ 4	\$ 15	\$ 9	\$ 10
Crop irrigation	\$ 146	\$ 56	\$ 67	\$ 53	\$ 138	\$ 29
Chemicals and application	\$ 53	\$ 37	\$ 40	\$ 30	\$ 45	\$ 28
Harvest - post harvest	\$ 26	\$ 54	\$ 34	\$ 37	\$ 32	\$ 34
Overhead	\$ 54	\$ 61	\$ 101	\$ 83	\$ 31	\$ 60
Total cost per acre	\$ 318	\$ 286	\$ 265	\$ 227	\$ 268	\$ 169
Yield, tons per acre	2.68	2.31	1.99	1.88	2.02	2.38
Break-even cost per ton	\$118.66	\$123.81	\$133.17	120.74	132.67	71.01
Market price per ton	\$ 90.00	\$ 90.00	\$ 90.00	90.00	90.00	90.00
Profit per ton ^{1/}	\$-28.66	\$-33.81	\$-43.17	-30.74	-42.67	-18.99
Gross receipts per acre	\$241.20	\$207.90	\$179.10	\$169.20	\$181.80	\$214.20
Variable cost per acre	\$204.78	\$158.47	\$144.18	\$140.02	\$177.29	\$ 93.11
Profit contribution margin ^{2/}	\$ 36.42	\$ 49.43	\$ 34.92	\$ 29.18	\$ 4.51	\$121.09
Water cost per acre	\$126.68 ^{b/}	\$ 36.41 ^{c/}	\$ 48.00 ^{d/}	\$ 44.33 ^{e/}	\$124.37 ^{b/}	\$ 13.50 ^{f/}
Water cost per acre foot	\$ 34.55	\$ 9.93	\$ 15.16	\$ 14.00	\$ 33.92	\$ 4.50

1/ Profit per tons equals market price less the break-even cost per ton.

2/ Profit contribution margin equals gross receipts from an acre less the variable expenses of producing that acre.

b/ Pump water.

c/ Water is a combination of surface and pump water.

d/ Water supplied by the Salt River Project.

e/ Water supplied by the Cortara Water Users Association.

f/ Surface water from Colorado River.

Source: Yield data from 1977 Arizona Agricultural Statistics

Cost data compiled from 1978 field crop budgets for the counties considered.