

# Arkansas budgets reflect increased profits for Concord juice grapes

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Profit estimates for Concord grapes in Northwest Arkansas have jumped from \$4.58 per acre (or approximately break-even) in 1985 to \$645.83 per acre in 1987. This estimate outlined in Table 1 would apply to vineyards yielding 8.55 tons per acre and utilizing supplementary irrigation and the Geneva Double Curtain (GDC) trellis. The 1987 estimated price of \$260 per ton is the upper limit of the five price levels used in Table 1. From the lower limit of \$185 per ton, the 1985 price, \$15 increments were used to illustrate the interaction between: (1) irrigated and nonirrigated culture, (2) GDC and Umbrella Kniffin (UK) trellis systems, and (3) constant 1986 vineyard production costs. The basis for Table 1 is a research study, Arkansas Agricultural Experiment Station Special Report 125 (April 1987) published on the University of Arkansas, Fayetteville campus.

The dramatic "about face" for income prospects is based on 1986 projections for Concord vineyard

operations. The resource input requirements would be similar to those of the more than 80 grower members of National Grape Cooperative in Northwest Arkansas. These farmers deliver grapes from more than 1,000 acres of vineyards to the Welch plant which is owned by National Grape Co-operative members. The plant is located in Springdale, Arkansas.

The Welch contract settlement price is decided approximately six months after harvest and is a composite of an initial advance at delivery plus periodic additions from profits as the juice is processed into retail products and sold

## 1986 Cost and Return Budgets Special Report #125

Production input prices were collected in 1986 from a representative sample of firms which sell farm supplies in the Northwest Arkansas area. Vineyard operational requirements were developed in terms of man and machine hours and chemical and

material input requirements. The combinations of data on costs and resources were entered into a budget generator program on the main-frame computer at the University of Arkansas, Fayetteville. The results were series of budgets showing costs and return by year of production and the current investment costs of establishing Concord grape vineyards (Single copies of Special Report 125 maybe obtained by writing Agricultural Publications, AG110, University of Arkansas, Fayetteville, Arkansas 72701).

To illustrate the research findings Tables 2 and 3 summarize parts of Special Report 125. These tables show the 1985 settlement price, total revenue, total 1986 costs, net returns, and cumulative costs per acre by year of production. Table 2 lists estimated costs and returns for irrigated grapes with the UK and GDC trellis systems. Table 3 lists the data for nonirrigated UK and GDC vineyard establishment and operations

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Table 1. Estimated average net returns above 1986 specified costs per acre for Concord grapes at six price levels by cultural and trellis system in NW Arkansas.

| Culture & Trellis | Average Price Per Ton |        |        |        |        |        |
|-------------------|-----------------------|--------|--------|--------|--------|--------|
|                   | \$185                 | \$200  | \$215  | \$230  | \$245  | \$260  |
|                   | Returns per acre (\$) |        |        |        |        |        |
| Non Irrigated     |                       |        |        |        |        |        |
| UK                | -110.57               | -39.32 | 31.93  | 103.18 | 174.43 | 245.68 |
| GDC               | -37.66                | 55.34  | 148.34 | 241.34 | 334.34 | 427.34 |
| Irrigated         |                       |        |        |        |        |        |
| UK                | -132.41               | -32.66 | 67.09  | 166.84 | 266.59 | 366.34 |
| GDC               | 4.58                  | 132.83 | 261.08 | 389.33 | 517.58 | 645.83 |

UK = Umbrella Kniffin; GDC = Geneva Double Curtain

costs.

The final settlement that National Grape Co-operative member-growers received in 1985 was reported to be \$185 per ton. Because Special Report 125 had been finished, reviewed and submitted for publication in December 1986, it was impossible to use the 1986 settlement price of \$194 per ton which was confirmed in March 1987.

At \$185 per ton, only the highest technology of the irrigated GDC trellis would be estimated to have a positive net return (Table 2). And this was relatively small profit so that it could be said that at \$185 per ton, new Concord juice grape vineyards would at best only be expected to break even.

During the 12-year period 1976 through 1987, National Grape Cooperative grower-members reported that settlement prices have averaged \$218.83 per ton with a range from a low of \$156 per ton in 1983 to a high of \$261 per ton in 1977. Between 1976 and 1987, year-to-year price changes averaged \$26.76 per ton. The smallest year-to-year change was \$1 per ton drop from \$257 in 1980 to \$256 in 1981, and the largest was the approximate \$60 per ton gain from \$194 in 1986 to an estimated price in excess of \$240 in 1987.

### Summary and Analysis

The costs of establishing vineyards as calculated in 1986 were used as a constant in estimating what the levels of return would be at six different price levels for grapes in Table 1. That is, costs were treated as if during the establishment period the price of \$185 per ton, for grapes was continued through Year 4. If product prices higher than \$185 per ton had been introduced into computations during Years 3 and 4 of establishment the total cumulative costs would be fractionally lower as well as would the constant per acre charge allocated to the 26 remaining seasons in expected vineyard productivity. Data reported in Table 8, Special Report 125

Table 2. Irrigated Concord grapes estimated revenue, cumulative costs and returns per acre by year and trellis system, 1986.

| Costs' and revenue                     | Years of Establishment and Production |         |         |         |                     |
|----------------------------------------|---------------------------------------|---------|---------|---------|---------------------|
|                                        | 1                                     | 2       | 3       | 4       | 5-30                |
| Irrigated culture                      |                                       |         |         |         |                     |
| <b>Umbrella Kniffin Trellis</b>        |                                       |         |         |         |                     |
| Expected yield per acre (tons)         |                                       |         | 3.0     | 5.0     | 6.65 <sup>3</sup>   |
| Market Price (\$)                      |                                       |         |         |         |                     |
| Total revenue                          | 185.00                                | 185.00  | 185.00  | 185.00  | 185.00              |
| Total costs (\$)                       | 0                                     | 0       | 555.00  | 925.00  | 1230.25             |
| Net Returns above Specified Costs (\$) | 1150.46                               | 795.54  | 1119.84 | 1236.70 | 1362.66             |
| Total Cumulative Costs                 | 1233.36 <sup>2</sup>                  | 2028.90 | 2593.74 | 2905.44 | 329.654             |
| <b>Geneva Double Curtain Trellis</b>   |                                       |         |         |         |                     |
| Expected Yield per acre (tons)         | 0                                     | 0       | 3.0     | 6.0     | 8.55 <sup>3</sup>   |
| Market Price (\$)                      | 185.00                                | 185.00  | 185.00  | 185.00  | 185.00              |
| Total Revenue                          | 0                                     | 0       | 555.00  | 1110.00 | 1581.75             |
| Total Costs (\$)                       | 1253.99                               | 881.03  | 1251.76 | 1417.47 | 1577.17             |
| Net Returns above Specified Costs (\$) | 0                                     | 0       | -696.76 | -307.47 | 4.58                |
| Total Cumulative Costs                 | 1336.892                              | 2217.92 | 2914.68 | 3222.15 | 365.59 <sup>4</sup> |

<sup>1</sup> Details on equipment operations, spray schedule, revenue and costs are in Ark Agri Experiment Station Special Report No. 125 (April 1987).

<sup>2</sup> Establishment costs included preplanting preparation costs

<sup>3</sup> In Years 5-30, yields were reduced by 5% from expected yield to reflect the risk of crop loss due to adverse weather and other factors

<sup>4</sup> Annual Establishment Charge which is the 4th year cumulative cost amortized at the 26-year 10.5% annuity rate over the remaining seasons of expected vineyard life.

Table 3. Non-irrigated Concord grapes Estimated revenue, cumulative costs, and returns per acre by year and trellis system, 1986.

| Costs' and revenue                     | Years of Establishment and Production |         |         |         |                     |
|----------------------------------------|---------------------------------------|---------|---------|---------|---------------------|
|                                        | 1                                     | 2       | 3       | 4       | 5-30                |
| Nonirrigated culture                   |                                       |         |         |         |                     |
| <b>Umbrella Kniffin Trellis</b>        |                                       |         |         |         |                     |
| Expected yield per acre (tons)         | 0                                     | 0       | 2.0     | 4.0     | 4.75 <sup>3</sup>   |
| Market price (\$)                      | 185.00                                | 185.00  | 185.00  | 185.00  | 185.00              |
| Total revenue                          | 0                                     | 0       | 370.00  | 740.00  | 878.75              |
| Total costs (\$)                       | 923.59                                | 559.52  | 811.39  | 915.28  | 989.32              |
| Net returns above specified costs (\$) | 0                                     | 0       | -441.39 | -175.28 | -110.57             |
| Total Cumulative Costs                 | 1006.49 <sup>2</sup>                  | 1556.01 | 2007.40 | 2182.68 | 247.65 <sup>4</sup> |
| <b>Geneva Double Curtain Trellis</b>   |                                       |         |         |         |                     |
| Expected yield per acre (tons)         | 0                                     | 0       | 2.0     | 5.2     | 6.2 <sup>3</sup>    |
| Market price (\$)                      | 185.00                                | 185.00  | 185.00  | 185.00  | 185.00              |
| Total revenue                          | 0                                     | 0       | 370.00  | 962.00  | 1147.00             |
| Total costs (\$)                       | 1027.11                               | 645.01  | 943.31  | 1103.05 | 1184.66             |
| Net returns above specified costs (\$) | 0                                     | 0       | -573.31 | -141.05 | -37.66              |
| Total cumulative costs                 | 1110.01 <sup>2</sup>                  | 1755.02 | 2328.33 | 2469.38 | 280.184             |

<sup>1</sup> Details on equipment operations, spray schedule, revenue and costs are in Ark Agri Experiment Station Special Report No. 125 (April 1987).

<sup>2</sup> Establishment costs included preplanting preparation costs

<sup>3</sup> In Years 5-30, yields were reduced by 5% from expected yield to reflect the risk of crop loss due to adverse weather and other factors

<sup>4</sup> Annual Establishment Charge which is the 4th year cumulative cost amortized at the 26-year 10.5% annuity rate over the remaining seasons of expected vineyard life.

were calculated as if the higher prices were in effect during the establishment period and would not be directly comparable to Table 1 of this article. At \$185 per ton and 1986 input prices, establishment costs per acre would be: nonirrigated culture -\$2182.68 (UK) and \$2469.38 (GDC); and irrigated culture-\$2905.41 (UK) and \$3222.15 (GDC).

Illustrations from Table 1 should identify the potential profits and risks from the investment requirements for establishing a grape vineyard. However, in the space of the three seasons of 1985, 1986 and 1987, the price has increased from \$185 to an estimated \$260 per ton or more than 40 percent. The increases in the price for Concord grapes may be evidence of a demand shifter trend in which consumers have been observed to be buying more products containing

natural fruit juices.

Returns to National Grape Cooperative members are based on sales of and profits from the processing operations. The prices paid should be a fairly accurate measure of demand for and supply or availability of Concord juice products. Therefore, even with vineyard establishment costs as much as

\$3222.15 per acre, there should be continued investments in Concord grapes. As long as settlement prices remain near current levels and contract acreage is available, Concord vineyards will be attractive to investment capital. At least one new vineyard planting is planned for 1988 in Northwest Arkansas as of this writing.