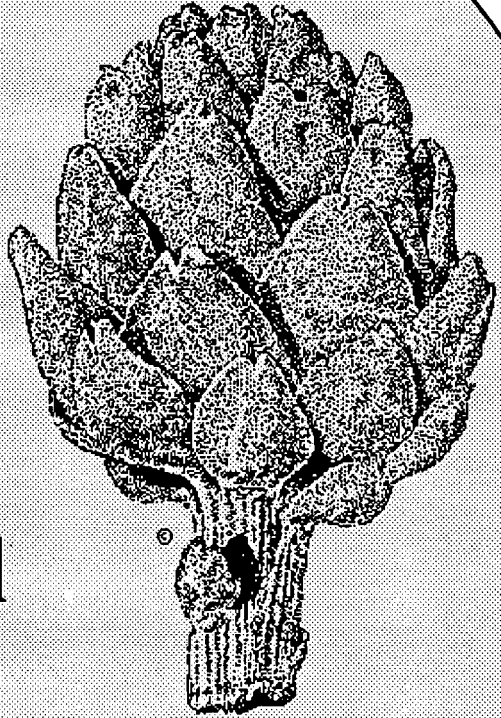


**Projected Production Costs
for**

AR-SI-93

Artichokes

1992-1993



**Imperial
County**

*University Of California
Cooperative Extension*

UC COOPERATIVE EXTENSION

ARTICHOKE PROJECTED PRODUCTION COSTS 1992-1993

Mechanical operation at custom rates. Hand labor at \$5.75 per hour (\$4.50 plus Social Security, unemployment insurance, transportation, supervision and fringe benefits).

Yield--600 23 lb. cartons per acre IMPERIAL STAR VARIETY direct seeded

OPERATION	CUSTOM RATE	MATERIALS		HAND LABOR		COSTS Per Acre
		Type	Cost	Hours	Dollars	
LAND PREPARATION						
Stubble disc	19.00					19.00
Subsoil	31.00					31.00
Disc 2x	10.00					20.00
Landplane 2x	10.75					21.50
Border, cross check & break borders	15.00					15.00
Flood		Water 1 ac/ft.	11.50	1	5.75	17.25
Wil-Rich chisel plow	12.75					12.75
Disc 1x	10.00					10.00
Triplane 1x	9.25					9.25
Fertilize, double spread	7.00	500# 11-52-0	67.75			74.75
List 40" beds	12.25					12.25
TOTAL LAND PREPARATION						242.75
GROWING PERIOD						
Precision plant	15.25	Seed 0.85 lb @ 300	255.00			270.25
Apply herbicide	8.00	Kerb	76.00			84.00
Sprinkler irrigate	140.00					140.00
Thin				5	28.75	28.75
Apply growth regulator 3x	8.00	Giberellic acid	23.40			47.40
Spike 1x	8.00					8.00
Cultivate and reshape 3x	14.50					43.50
Fertilize and furrow out	10.00	100# N @ .31	31.00			51.00
Water-run fertilizer		60# N @ .31	18.60			18.60
Hand weed 3x				12	69.00	69.00
Layby herbicide	8.00	Goal	38.50			46.50
Irrigate 6x		Water 3 ac/ft.	34.50	7	40.25	74.75
Gated pipe	47.50					47.50
Chop residue	11.00					11.00
TOTAL GROWING PERIOD						940.25
GROWING PERIOD & LAND PREPARATION COSTS						1183.00
Land Rent (net acres)						225.00
Cash Overhead----- 12% of preharvest costs & land rent						168.96
TOTAL PREHARVEST COSTS						1576.96
HARVEST						
Custom harvest: cut, pack, haul and sell (extra services not included)						1800.00
TOTAL ALL COSTS						3376.96

PROFIT OR LOSS PER ACRE price/ 23 lb. carton

		price/ 23 lb. carton					Break-even \$/carton
		4.00	5.00	6.00	7.00	8.00	
Cartons per acre	400	-1177	-777	-377	23	423	6.94
	500	-1077	-577	-77	423	923	6.15
	600	-977	-377	223	823	1423	5.63
	700	-877	-177	523	1223	1923	5.25
	800	-777	23	823	1623	2423	4.97

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ARTICHOKE CULTURE 1992-1993

ACREAGE AND YIELD: There were roughly 400 acres of artichokes grown in Imperial County in 1991. A few hundred acres more are grown in Yuma, Arizona and the Coachella Valley. Yields vary considerably from a low of 300-400 cartons per acre to a high of over 1000 cartons per acre.

Fields are planted in late August or early September for harvest in late fall or early spring depending upon planting date and whether growth regulators were applied.

The desert grown "chokes" compete in the marketplace with those from Castroville which have limited production during the desert marketing season. When freezes occur in coastal California, artichoke production is nil; then a high market value for the desert crop can be realized. Conversely when production increases in coastal California in mid-Spring, the value of desert grown artichokes diminishes rapidly.

Warm weather increases the toughness and decreases flavor in the buds. Seldom will desert chokes be marketable after early April.

VARIETIES: Most of the desert-grown artichokes are direct seeded or grown from transplants. Few if any are grown from cuttings from mother plants.

"Imperial Star" is a public variety which may be grown from seed or used to produce transplants. It produces a large volume of glossy green buds in the 24-36 count range. Imperial Star was released by the University of California from selections made from advanced breeding material obtained from the USDA. "Emerald" is another variety available for local use with direct seed.

There are a number of other cultivars grown locally, many of which are proprietary lines grown by individual shippers.

PLANTING: Artichokes are grown on a wide range of bed widths from 80-44", with 72" being common. Some growers list 36" or 40" beds and plant alternate ones. This system allows for emergence by furrow irrigation or sprinklers may also be used. Narrower bed spacings have not worked out as well as crowding of the plants causes smaller buds to develop and harvesting is more difficult due to foliage density.

Seed may be planted "hill drop" style with 2-4 seeds every 2' in-row, or planted every 6" and thinned. Final plant spacing is generally around 2' in-row, however, some growers go closer (18") or wider (36"). Germination on artichoke seed is low, especially in hot weather. Artichokes are **cool season** plants planted out-of-slot in order to hit a specific market window. This should be kept in mind as stand failures may occur under adverse conditions even with sprinkler irrigation.

Precision air or belt planters are commonly used for artichokes. Some random flow plate planters are also used.

Artichoke seed is quite large (13,000 seeds/#). Using 72" beds and dropping 3 seeds 1" apart on 24" centers, one would need about 10,890 seeds (10.9M or 0.84#) per acre.



ARTICHOKE (continued)

Transplants using the same 72" bed system on a 24" in-row spacing would require roughly 3630 plants/acre. A rule-of-thumb is to supply the transplant growers a quantity of seed calculated by multiplying the number of transplants desired x a factor taking into account the germination percentage plus a 25% surplus. If the seed were 70% germination, this would be 3630 plants per acre X 100/70 = 5186 seeds plus 25% more = 6481 seeds are needed to produce one acre of transplants.

SOILS AND IRRIGATION: Artichokes are grown on a wide range of soil types including sandy loams and silty clays provided soil moisture is adequate. Drip irrigation is often used to supply a near optimum soil moisture content.

During the initial part of the growing season, artichokes do not make much growth due to high temperatures. Sixty day old plants may not be much larger than a dinner plate. As the weather cools, the plants start to grow. During the rapid vegetative growth stage, artichokes will use a large amount of water. As the crop approaches maturity, weekly irrigations (or even more frequently) are needed.

FERTILIZER REQUIREMENT Preplant applications of 200# P₂O₅ as 11-52-0 are broadcast and listed into the beds. Other alternatives are to apply 10-34-0 liquid injected into the beds at planting.

During the season, an additional 150-200# actual nitrogen is often used. Common sources of N are liquid ammonium nitrate or UAN 32.

PEST AND DISEASE CONTROL Early season just after planting artichokes may be attacked by crickets, darkling ground beetles, grasshoppers and armyworms. Foliage pests include painted lady butterfly, cutworms, and salt marsh caterpillar.

The artichoke plume moth is not an established artichoke pest in the desert. The best way to keep the moth from becoming a problem is to not bring in artichoke transplants from infested areas and avoid oversummering of established plants.

There are some unidentified root rotting fungi which occur on occasion.

GROWTH REGULATORS: Gibberellic acid (GA) is sometimes used to force bud initiation for earlier harvest, especially for plantings to be harvested in December. Three applications of GA @ 20 ppm are made starting roughly 8 weeks after transplanting or when the plants are dinner plate size in spread. The volume of solution should be sufficient to wet the foliage.

HARVESTING: Artichokes are harvested when there are sufficient amounts of primary or "king" buds of sufficient size to warrant their removal. King buds may grow as large as 8-10" in diameter and still be marketable. The sizes most preferred by the buyers are extra large 24's (4-4.5" diameter) and large 36's (3.5-4" diameter). Other sizes sold are medium 48's and occasionally jumbo 18's and small 60's. Bags of small loose "baby artichokes" containing 70-120 buds may be sold if the price warrants the expense of harvesting.

Artichokes are subject to bruising during harvest and packing. The damage is not expressed until several days after harvesting. Bruises will show as



ARTICHOKE (continued)

darkened off-color areas and can become a site for infection by molds and bacteria.

Harvesting is normally done by hand, cutting the buds from the plant with a sharp knife. The cut buds need to have a 2" stem. The 'chokes are placed in bins, trailers or directly on field packing machines. They are hand sorted, size and packed in waxed, fiberboard cartons.

Full cartons of 'chokes should be hydrocooled soon after harvest and then held in cold storage until transit to terminal markets.

"Frost kissed" or "winter kissed" 'chokes are those which have been exposed to a mild frost. The epidermal layers blister and whiten after exposure. After a few days the bracts turn a bronze color. While the frost changes the cosmetic appearance, the quality of the choke is still good.

Harvesting of overmature buds should be avoided as they are woody, strong flavored and can influence the buyer to avoid future purchases.

POSTHARVEST HANDLING: Normally artichokes should not be stored for long periods of time. Chokes should be held at temperatures just above freezing and with 95-100% RH. Cartons should be well ventilated to allow for water escape from hydrocooling and release of heat and gases produced by respiration.

NUTRITION: A medium artichoke is low in calories, low in sodium and high in dietary fiber. It also contains small amounts of vitamin C and magnesium.

