FACT SHEET

L-889

Keys to Profitable Fresh Carrot Production

Sam Cotner, Tom Longbrake and John Larsen*

The commercial value of the Texas carrot crop usually ranks first or second to that of onions. Since 1959, the harvest carrot acreage has averaged approximately 36,500 acres with an average value of about $19 million. In 1968, the value of the carrot crop exceeded $22 million with approximately 23,000 acres harvested.

Areas of production. Two major areas of carrot production are the winter production area, consisting of the Rio Grande Valley, Laredo and the San Antonio-Winter Garden area; and the early fall production area, consisting of the High Plains and Trans-Pecos areas. Usually, 70 to 85 percent of the Texas acreage is in the Rio Grande Valley. In the winter production area, seeding begins in late July and continues into February, with most active seeding in September through November. Harvest usually begins in November wtih heavy shipments occurring from January through April. Late crops furnish production into June.

In the High Plains and Trans-Pecos areas, planting begins about mid-April and continues into August. Harvest starts in late July and continues into January, with highest peak movement from mid-September through November.

Seasonal movements. Movement of Texas carrots to market is shown in figure 1. Peak production of Texas carrots occurs during the winter when Texas furnishes a major portion of the total U. S. supply. Texas growers should plan their production on an area or state basis whereby the demand can be supplied and yet maintain the price at a level profitable to them.

Climatic requirements. Carrots grow best amid a 65-degree average temperature. Since carrot plants are damaged by temperatures in the low twenties, winter production of carrots is limited to South Texas. High temperatures result in poor color development and generally poor quality. Ideal temperature conditions would be 55 degrees at night, with 75 degrees during the day.

Soil types. Carrots can be grown on most Texas soils; however, the most desirable for commercial production is a loose, friable, sandy loam. Such a soil enables the plant to develop a long, smooth, straight root. In general carrots tend to mature slowly on heavy soils. Soil types must be considered individually, especially from an irrigation and fertility standpoint, since each type responds differently to applications of water and fertilizer.

Fertilizers. The fertility level of the soil influences any fertilizer program. In general, nitrogen and phosphorus are used in equal amounts, applied 3 to 6 inches deep in the bed before planting. Approximately 60 pounds per acre of nitrogen and of phosphate normally are sufficient for carrot production in most areas of Texas. Should the growth rate seem slow, apply in the water furrow an extra 30 pounds per acre of nitrogen. During the latter part of the growing season, avoid adding too much nitrogen which may cause excessive top development. Carrots require exceptionally high amounts of potassium, but most Texas soils in the carrot-producing areas contain sufficient amounts of potassium. Fertilizer to be banded in the bed should be placed below and to the side of the seed row. A carrot root forced to grow through a band of nitrogen fertilizer, may branch.

Varieties. Imperator is the standard fresh market variety in most areas of Texas. Long Imperator and Imperator 58 comprise about 90 to 95 percent of the carrot acreage in Texas. Other varieties include Gold Pak, Chantenay and Danvers. Several new hybrid varieties have been released and are worthy of trial.

Seeding rates. Most growers plant two rows of carrots 14 to 16 inches apart on shaped beds, 36 to 40 inches from center to center. Some growers plant as many as six rows on the bed. In the row, spacings may vary from ¾ to 3 inches, depending

*Extension horticulturists, Department of Soil and Crop Sciences, Horticultural Section, Texas A&M University.

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upon soil types. Heavier soils should have wider spacing.

The amount of seed used per acre may vary from less than 1 pound to as much as 4 pounds, depending upon spacing. If pelleted seed are used, seeding rate may vary 2 to 15 pounds per acre (seed plus pelleting material).

Irrigation. Most carrots are planted dry and subirrigated up. A pre-planting irrigation may be desirable to supply ample subsurface soil moisture and to germinate weed seeds which can be destroyed during the planting operation. If the pre-planting irrigation is omitted, apply the water shortly after planting.

The amount of water used during the growing season depends primarily on rainfall and soil type. Generally, 3 acre-inches of water are needed during each 4-week period; but growers should water according to plant needs. On heavier soils, moisture should be sufficient to prevent the soil from cracking or hardening, which could result in many deformed roots. During the last 2 to 3 weeks of the growing season, limit moisture because root development proceeds more rapidly in soil that is well below field capacity.

Cultivation. Cultivate the soil prior to planting by harrowing or floating to destroy small weeds. A second cultivation may be needed as soon as the young seedlings are large enough to be worked without causing excessive injury or coverage.

Cultivate only as needed, and never cultivate when fields are wet. Deep intercultural tillage is of doubtful value on well-prepared loamy soil.

Weed control. Pre-plant application of Treflan, incorporated approximately 2 inches at the rate of ½ to ¾ pounds per acre is recommended for weed control. For post-emergence weed control, naptha-type oil at the rate of 40 to 100 gallons per acre should be sprayed after the carrots have two or three true leaves and before the root is ¼ inch in diameter. Naptha does not control ragweed. Linuron (Lorox) at the rate of 1 to 2 pounds actual ingredients applied in 30 to 40 gallons of water, also is recommended, but should be applied only after the carrots are 3 inches tall. Lorox kills winter weeds such as London rocket (mustard), Sowthistle and henbit, as well as summer weeds and grasses.

A new herbicide, TOK-E25, shows promise for use as both a pre-emergence and post-emergence herbicide. For further information on weed control, see L-755, Chemical Weed Control in Irrigated Vegetables, available from county agents.

Pests and diseases. Growers should be alert for wireworms if the carrot crop follows any type of grass crop. Cutworms may be a problem in the seedling stage. Carrot weevils often cause damage about mid-season. Consult the MP-675, *Texas Guide for Controlling Insects on Commercial Vegetable Crops.*

Carrot diseases. Several diseases are known to affect carrot production in our state. Seedling disease or damping-off may be a problem during periods of prolonged wet weather. Some control may be obtained by using high quality seed and treating the seed with a protectant fungicide (Thiram, 4 ounces per 100 pounds of seed). Root knot nematodes and cotton root rot can cause great damage to carrots. These two diseases can be controlled by practicing crop rotation. If nematode infested land is to be used, it may be necessary to use a soil fumigant prior to planting. Leaf blight, caused by the fungi Alternaria and Cercospora, will reduce both yield and quality if not controlled. Copper containing fungicides and maneb have been effective in controlling this disease. Several applications may be necessary to obtain adequate control. These chemicals should be used at the rate of 1½ to 2 pounds per acre with a spreader sticker and in enough water to assure proper coverage. Aster yellows can sometimes be serious. Destruction of weeds in the fields and in areas close by, together with an effective insect control program should reduce most of the damage caused by this disease.

Harvesting and packaging. Carrots for fresh market are harvested when most of the roots are ¾ to 1½ inches in diameter at the crown.

Especially designed carrot "lifters" loosen the soil so that the roots can be pulled from the soil with minimum breakage. After loosening, the carrots are lifted from the soil, by hand or mechanically; topped and placed in field bags and hauled to the packing shed, where they are washed and graded. The majority of the carrots are packed as "cello" bag carrots and placed in 1-pound film bags. These film bags usually are packed in 48-pound master containers for distribution.

Marketing. Texas carrots are grown under contract at a specified price per acre or per ton, or sold on the open market at the prevailing prices.

Cost and returns. The estimated cost and return of Texas Rio Grande Valley fresh market carrots on an acre basis is given in Table 1.

The total cost of producing, harvesting, packing and selling carrots per 50-pound bag as influenced by yield per acre is given in Table 2. The cash expense, land and overhead costs remain relatively

Table 1. Estimated costs and returns of Texas fresh market carrots in the Lower Rio Grande Valley

	No. of units and value per unit	Value or cost	
1. Production receipts:	360 50-lb. bags @ $2.15[1]	$774.00	
2. Cash Expense:			
Tractor equipment	15 hr. @ $ .80	12.00	
Tractor labor	17 hr. @ $1.50	25.50	
Other labor (Irrigation, hoeing)	18 hr. @ $1.40	25.20	
Seed	2 lb. @ $2.25	4.50	
Insecticide	2 app. @ $2.00	4.00	
Fertilizer 100-60-0	160 lb. @ $ .11	17.60	
Fungicide	4 app. @ $4.00	16.00	
Herbicide—Treflan	1 qt. @ $8.50	8.50	
—Lorox	4 lb. @ $2.95	11.80	
Irrigation water	4 app. @ $3.00	12.00	
			$137.10
3. Land expense:			
Taxes	.5 yr. @ $10.00	$ 5.00	
Interest on land @ 6% on $400	.5 yr. @ $24.00	12.00	
			$ 17.00
4. Overhead			25.00
5. Harvest & marketing expense:			
Harvesting	360 bags @ $ .50	$180.00	
Packing (includes container)	360 bags @ $1.10	396.00	
Selling	360 bags @ $ .10	36.00	
	$1.70		$612.00
6. Total expense			791.10
7. Return to management			—$ 17.10

[1]Based on Texas winter carrot average price 1964-68.

Table 2. Cost of production and marketing per 48 one-pound bag of Texas carrots as influenced by marketable yield per acre[1]

	Cost per 50 lb. bag of carrots		
No. bags/A	Production[1]	Harvesting, packing[1]	Total fob cost
150	1.19	1.70	2.89
200	0.89	1.70	2.59
250	0.71	1.70	2.41
300	0.60	1.70	2.30
350	0.51	1.70	2.21
400	0.45	1.70	2.15
450	0.40	1.70	2.10
500	0.36	1.70	2.06

[1]Based on cost estimates shown in Table 1.

stable, totaling $179.10 per acre. The harvesting and marketing cost varies as the yield per acre changes. With higher yields, the unit cost per bag decreases while the harvesting and marketing costs per bag remain the same.

Figure 2 shows that as the price per unit increases, the per acre yield required to break-even decreases. For an average yield of 360 bags per acre, a price of $2.20 per bag would be required to break even, based on cost of production estimate in Table 1, and using 1964-68 average prices for Texas winter carrots.

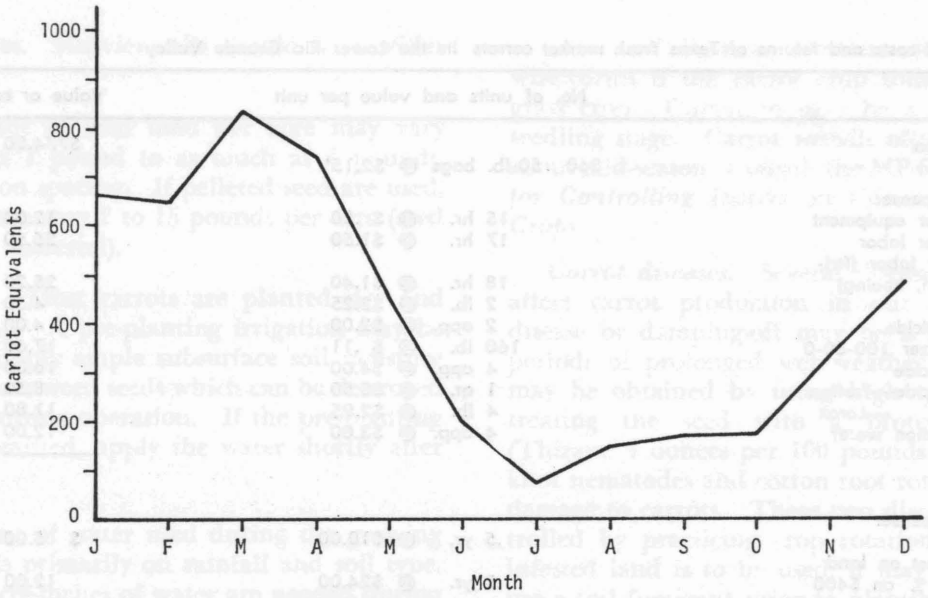

Fig. 1. Average Texas carrot shipments in car-lot equivalents by months, 1964-68.

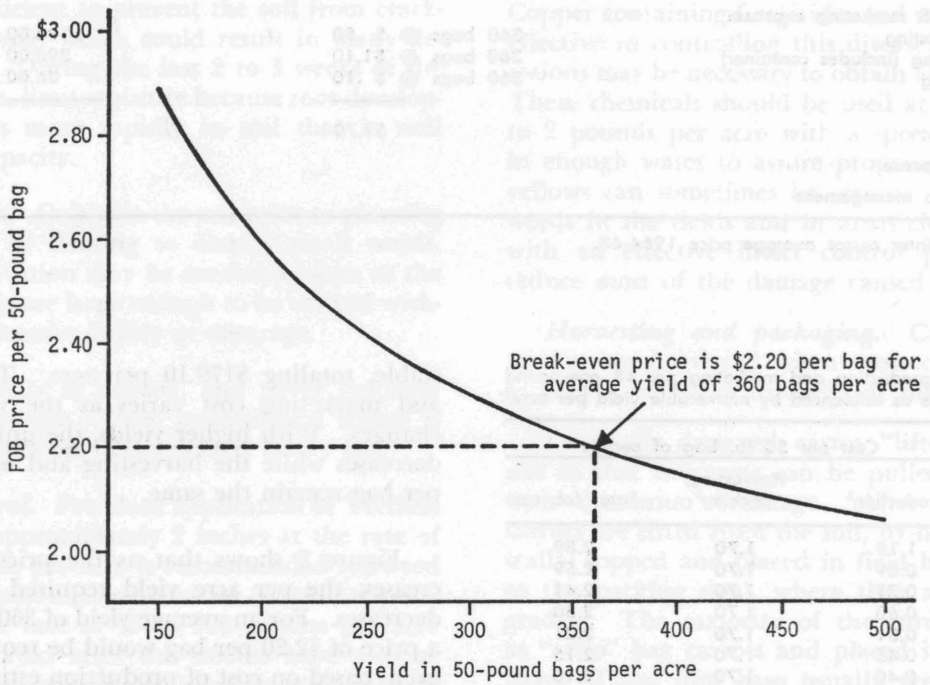

Fig. 2. Relationship of total cost per 50-pound bag of Texas carrots to the yield per acre indicating f.o.b. price required to break even at a given yield. Based on figures in Table 1.

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