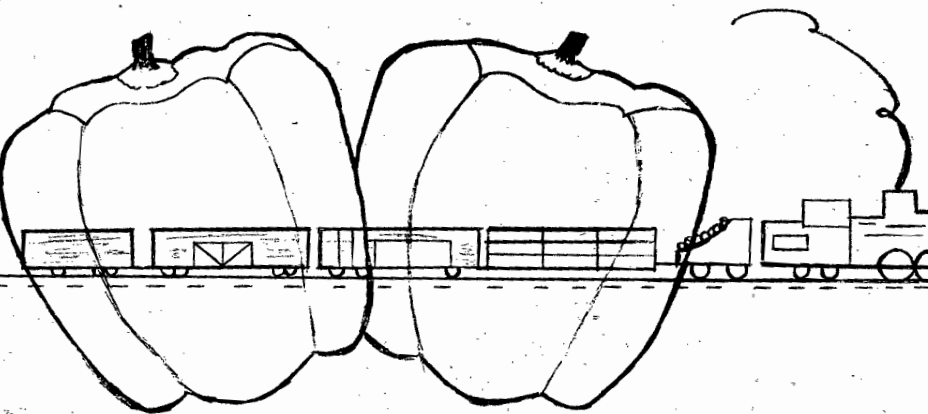


PEPPER

PRODUCTION

IN

STANISLAUS COUNTY



PESTICIDE RESIDUES:

These suggestions for pest control are based on the best information currently available for each pesticide listed. If followed carefully, the suggestions should result in satisfactory control and should not leave residues that will exceed the tolerance established for any particular chemical. To avoid excessive residues on the harvested crop, follow suggestions carefully with respect to dosage levels, number of applications, and minimum interval between application and harvest.

Residue information for disease control is based largely on data from the Pesticide Regulation Section of the United States Department of Agriculture, and other reliable sources.

THE GROWER IS RESPONSIBLE for residues on his crops as well as for problems caused by drift from his property to other properties or crops.

PEPPER PRODUCTION IN STANISLAUS COUNTY

Pepper production in Stanislaus County at the present time is largely limited to the Westside. Bell or sweet pepper is the only type grown commercially. The California or Anaheim has been grown in very limited amounts but yields well and the fruits are of excellent quality.

In 1959, 623 acres of bell peppers were grown in the Crows Landing and Westley area. Yields ranged from two to nine tons per acre. Mosaic, a virus disease, was the greatest factor contributing to some of the low yields. Verticillium wilt and blossom-end rot occasionally reduces the yield and quality extensively.

The Sorrento soil series is well adapted to heavy yields of high quality peppers because of the texture, internal drainage, fertility and water-holding capacity.

Most of the bell pepper production is sold fresh as mature green fruit. There is, however, a small amount of green or ripe fruit sold to be put up in brine, dried and ground or diced.

VARIETIES AND TYPES:

California Wonder and Yolo Wonder are the two most popular varieties of sweet peppers. Calif. Chili pepper (Anaheim) yields well and produces high quality fruit. A suitable market would increase the production of both sweet and chili peppers in this area. Production practices are virtually the same for these two types of peppers.

Yolo Wonder color is less desirable for processing in the red stage than California Wonder. Yolo fruit is not so desirable in shape, size, thickness of flesh and is somewhat smaller than Calif. Wonder. Yolo tends to be rougher early in the season and the plants are smaller. There is a

tendency for Yolo fruits to be crowded, sometimes resulting in plant breakage when harvested. Yields depend on market demands and disease factors. In practice Yolo will yield longer because of its resistance to tobacco mosaic. After harvest begins tobacco mosaic spreads rapidly in California Wonder fields. Yolo is a week to ten days earlier than California Wonder.

SOIL AND CLIMATIC REQUIREMENTS:

Peppers are a warm season crop. They require a long-growing season for maximum production. After production starts it continues until frost brings the season to a close.

Temperatures for optimum seed germination is in the 60° to 85° F. range. At 68° F. soil temperature seedlings should emerge in 12 days, at 77° in 8 days, and 86° F. in 7½ days.

Pepper seed will germinate over a wide range of soil moisture conditions; however, more uniform emergence is obtained at the upper moisture levels.

Optimum plant growth occurs in the 70° to 85° F. range. Fruit set becomes very light below 60° F. and over 90° F. when flowers drop. Inadequate soil moisture and hot, drying winds, or poor root systems may cause excessive blossom drop. Pepper flowers are only open 24 to 30 hours; consequently, short periods of adverse weather may influence the set of individual flowers. Fruits are subject to sunburn; therefore, an adequate foliage cover is desirable.

FERTILIZER:

Peppers, especially the foliage, responds readily to adequate amounts of nitrogen. Early growth is stimulated by an application of 20 to 30 lbs. of

phosphates under the seed. Peppers are rather shallow-rooted plants so a summer application of nitrogen is often needed for best results. This is especially true on soils having good internal drainage. Seventy-five to 150 pounds of actual nitrogen is used depending on the soil and previous crop history. Phosphates applied after thinning has not been a sound practice. We have never been able to show response of any kind (growth or quality) to potash.

IRRIGATION:

Germination and seedling growth have been more uniform in the upper range of soil moisture. After emergence the surface soil should be kept dry as much of the time as possible to avoid damping-off. Pepper roots penetrate to a depth of four feet. After plants are well established each irrigation should penetrate to the four-foot depth. Moderate irrigation intervals are most essential to proper growth, fruit setting, and the prevention of blossom-end rot. A soil probe will help determine water penetration.

Over-irrigation stimulates phytophthora and other root-rotting organisms. Drowning or suffocation is a common condition which causes plants to collapse.

CULTURAL PRACTICES:

Field Seeding - Soil should be worked to give good tilth for seeding. If the soil is dry, an irrigation should be given to supply moisture for uniform germination. Seed is usually drilled after bedding. Thirty inches is a common row-spacing. Four pounds of seed are usually used to secure an adequate stand. Normal planting depth is 1 to $1\frac{1}{2}$ inches. When 3 to 5 inches tall, the plants should be thinned to about 14 to 18 inches in the row. Larger plants suffer more from shock and

take longer to recover. Weed competition is serious while pepper plants are small. Weed control with carrot oil, pre-emergence, is a money saver and prevents excessive root disturbance at thinning time.

TRANSPLANTS:

Establishing a field of peppers with transplants has been a common practice in many parts of the state. It is still used extensively in some areas. There are several advantages in transplanting. If a field is to be double-cropped, it may be advantageous to grow the transplants early and set them in the field. There is a considerable reduction in the amount of seed used. Four ounces will produce the 8,000 to 10,000 plants required to plant an acre.

Damping-off can be a problem with field-seeded peppers while a plant bed can be treated economically with a Semesan drench at the rate of one ounce per two gallons of water on 16 sq. ft. of soil surface. Timing is important; it should be applied just after the first root appears on most of the seeds which is usually 5 to 7 days after seeding. After emergence spraying plant beds with Semesan will aid in the control of later infections of damping-off organisms.

In comparing the direct-seeded method vs. transplanting, there is very little difference in the total expense. The hoeing operation previous to thinning and the thinning operation, of course, are not needed when plants are used. The transplanting operation, however, is slow and expensive which approximates the cost of the first hoeing and thinning.

SEED PRODUCTION:

Pepper seed is produced in California using the same cultural practices as for fresh fruit. Fruit is harvested at the red ripe stage. Pods lying on the ground should not be saved--they may be infected

with Rhizoctonia. Peppers cross-pollinate; consequently, a seed field should be located at least 100 yards from any other variety.

HARVESTING AND STORAGE:

Bell peppers are usually harvested when full grown but still green. Fruits are snapped off by hand and carried off the field in sacks or buckets. However, recently the mobile field loader has proved to be more economical on large fields. It also has an advantage in less plant breakage.

Harvest should be at regular intervals in order to maintain production over a long period. Green peppers hold best at temperatures between 45° and 50° F.

CONTROL OF INSECTS:

Aphids are the dominant insect pest on peppers in this area. They damage the plants by their sucking action. Aphids also spread mosaic virus from plant to plant and seriously reduce yield and quality. Ten per cent nicotine dust or the phosphate insecticides are used to control these pests.

Darkling Ground Beetles girdle the stems near the ground level. Ten per cent DDT dust will protect the seedling plants.

Corn Earworm is a serious pest of peppers and can be controlled by the use of DDT.

These insecticides are subject to change by new regulations of the Pure Food and Drug Administration.

NEMATODES:

Peppers are resistant to nematode damage; however, a heavy infestation can reduce the vigor or the plants. DD, EDB or Nemagon will reduce the population.

CONTROL OF DISEASES:

Mosaic - The leaves are mottled and dwarfed and the plants may become stunted. The disease is spread by aphids and by handling the plants. Good control of aphids reduces its spread.

Verticillium Wilt - is a soil-borne fungus, which causes a brown discoloration in the stem. Plants wilt and die. Avoid planting for several years on land where the disease has caused damage. Avoid following such crops as tomatoes, potatoes or strawberries.

Blossom-end Rot - Sunken, light brown spots on the end or sides of the fruit are due to a physiological disorder caused by a deficiency of moisture in the plant while the fruit is growing. This deficiency may be caused by hot winds and lack of soil moisture. A common cause of blossom-end rot is excessive irrigation causing root damage and the resulting inability for roots to supply adequate water to the plant and fruit.

Western Yellows - cause the plants and fruits to become stunted. An early infection can seriously reduce yield and quality. The sugar beet leafhopper is the insect which spreads this particular disease.

SHOULD I PLANT PEPPERS?

Bell peppers like many of our specialty crops are not a major cost in the diet of the American family. The cost to the consumer, whether low or high, does not materially affect the consumption. Under these conditions the pepper market can be easily flooded with a moderate increase in acreage.

Growing peppers is highly speculative so a new grower should be well financed. He should also have reliable marketing facilities before entering this field.

C O S T S T U D Y

We believe a cost study is a valuable addition to any production leaflet. It gives a prospective grower detailed information on the labor requirements, time spent on each operation, normal fuel and repair costs, material costs on an acre basis. In addition it takes into consideration "ALL" costs, such as insurance, depreciation, taxes, etc.

This cost study is broken down into detailed operations so it can be used by growers who sell to packers or used by semi or fully integrated operations where production, harvesting, packing and shipping are under one management head.

We have used a yield of 9 tons per acre of packed fruit because with good management on our better soils, coupled with normal hazards, this yield can be expected. In addition to the 9 tons of fresh fruit, occasionally two or three tons of ripens can be sold to processors.

TYPICAL COSTS OF GROWING AND HANDLING BELL PEPPERS
 Westside - Stanislaus County
 100 Acre Pepper Operation on 400 Acre Farm
 Yield per Acre - 9 Tons of Fresh Fruit
 Equipment, Field, Hoe and Thinning Labor: \$1.10 per hour
Labor & Cash Costs Per Acre

Operation	Hours Per Acre	Labor	Fuel and Repairs	Mate- rial	Cont. Ser- vice	Total Costs Per A.
Disc	.25	.28	.64			.92
Subsoiler	2.00	2.20	5.10			7.30
Plow	.75	.83	1.91			2.74
Disc	.25	.28	.64			.92
Bed up and Roll	1.00	1.10	.58			2.68
Plant & Fertilizer 2 men	1.00	1.10	.58	22.50		24.18
Spring Tooth	.15	.17	.38			.55
Land plane	.66	.78	1.65			2.43
Harrow (spike)	.25	.28	.58			.86
Seed				25.00		25.00
Insecticide Dust 8X					48.00	48.00
Prepare to irrigate - 4 men	.40	.44	.90			1.34
Irrigate, 1st and 2nd	2.20	2.42				2.42
Grade in ditches - 2 men	.20	.22	.45			.67
Cultivate 5X	2.50	2.75	2.65			5.40
Hoe - pre-thinning	15.45	17.00				17.00
Thin	45.45	50.00				50.00
Chisel & Furrow out rows	.50	.55	.53			1.08
Prepare to irrigate	.40	.44	.90			1.34
Irrigate 3rd and 4th	2.20	2.42				2.42
Grade in ditches - 2 men	.20	.22	.45			.67
Hoe	13.63	15.00				15.00
Prepare to irrigate	.40	.44	.90			1.34
Irrigate 5th & 6th	2.20	2.42				2.42
Hoe	13.63	15.00				15.00
Irrigate 7th & 8th	2.00	2.10				2.10
Water-Power to Pump				20.00		20.00
Grade in ditches - 2 men	.20	.22	.45			.67
Stake, cut & regrade roads	.50	.55	.45			1.00
Misc. other work	3.00	3.30				3.30
Pickup Truck plus 10%			1.27			1.27
Total Cultural	111.17	\$122.51	\$21.01	\$67.50	\$48.00	\$260.02

Harvest

Misc. Costs - Office telephone, hand tools, boots, interest on operating capital, etc. @ 5% of cost	17.75
Taxes on P.P.	1.28
Insurance - Fire and Liability	1.25
Land rent	75.00
Interest on equipment & housing (1/2 of 37,825)	2.37
Depreciation on equipment & housing (1/2 of 37,825)	12.10
Total	109.75
Packing - 1.00 per carton 30#	600.00 /A
Selling - 10%	150.00 /A
Pick, load & haul .25 per carton	150.00 /A
Total Harvest	\$900.00 /A
Total Cost	\$1197.21 /A