

GROWING

CO-VS-57

HYBRID CORN

IN

TULARE COUNTY



UNIVERSITY OF CALIFORNIA
FARM AND HOME ADVISORS OFFICE
TULARE COUNTY
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GROWING HYBRID CORN IN TULARE COUNTY

By:

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Hybrid corn, although a relatively new crop to Tulare County growers, is beginning to find a place in the farming program of many growers. This crop offers to the grower several potential market outlets. He may sell it at harvest for cash, he may hold the grain until a later date and then sell it, he can use the crop for silage or for grain, he can grind the corn and cob for meal, and he can use the residue left in the field after grain harvest as pasture for his stock.

Yields of $2\frac{1}{2}$ tons of grain per acre or 20 tons of silage per acre can be obtained when this crop is planted on good soil and proper production practices are followed. Many growers have observed better water penetration and more easily worked soil following the incorporation of corn residue into the soil.

PLANTING

Early spring planting, after the danger of frost is past, is recommended for maximum production. Generally, planting can be started any time after the 20th of March without danger from late frost. Plantings can be made as late as early July with a reasonable chance of success, if short-season varieties are used. However, yields will probably be reduced and disease and insect damage is likely to be greater. Planting too early, too deep, or in a poor seed bed, will usually result in a poor stand. Normally, a pre-irrigation is necessary to supply

moisture for germination and seedling establishment. Occasionally, spring rains will be heavy enough to eliminate the necessity of a pre-irrigation. The seed bed should be moist, firm, and as free of weeds as possible.

Corn may be planted on the flat, on a bed, or in a furrow. All three of these methods are successfully used in the county. The method is generally determined by the grower's method of planting cotton and the equipment he has available. There may be some advantage in furrow planting, if one of the large grain varieties or a silage variety is to be used.

Corn should not be planted too deep. Depth of planting normally should be 1 to $1\frac{1}{2}$ inches in heavy soils and from 2 to 3 inches in the lighter soils.

RATE OF PLANTING

Corn in this area is easily planted with a cotton planter using corn plates. Uniform stands are desirable for weed control. The grower should be careful to obtain seed and plates to match. Seed dropped should be regulated as closely as possible and about 20% more seed should be planted to take care of loss of plants due to lack of germination.

Rate of planting is dependent upon a number of factors - soil fertility, seed size, varieties, and other factors. The plant population desired is a better determination of how much seed to plant, rather than the pounds of seed per acre. A high plant population (24,000 or more plants per acre - 7" or closer spacing on 40" row), is desirable when enough fertilizer and water are supplied and the proper variety is used. If there are limitations, either on fertility level or amount of water avail-

able, low populations (15-20,000 plants per acre - 9" - 10" spacing on 40" row), will provide better results. Experimental evidence has shown that with high plant populations, high yields are obtained only if sufficient moisture and fertility are supplied to maintain the high populations.

At lower plant populations, yield responses do not vary greatly as long as adequate amounts of moisture and fertilizer are supplied.

Experimental evidence further indicates that the short early-maturing varieties are more likely to give increased yields by using high population, than are the tall late-maturing varieties.

FERTILIZATION

Corn is a heavy user of nitrogen. A 100 bushel crop of corn (5600 lbs. shelled) used about 150 lbs. of actual nitrogen. The amount of fertilizer required by the crop will depend on a number of factors. Corn grown on soils of high natural fertility will require less fertilizer than corn grown on soils of low fertility. The number of plants per acre will greatly influence the amount of fertilizer necessary. Field trials conducted in the county on several of the major soil types have shown that maximum results from nitrogen may be obtained the first year corn is grown with an application of 100 to 125 lbs. of actual nitrogen, when the plant population is from 18 to 23,000 plants per acre. When populations above 23,000 plants per acre are used, nitrogen required for maximum production will be about 200 lbs. of nitrogen for the first year. At both of these populations, an extra 50 lbs. of nitrogen will be necessary when the corn is planted the following years in the same field. Lack of available nitrogen may be indicated by slow plant

growth and light green or yellow foliage.

Soils in the county where phosphorous is deficient should receive a phosphorous fertilizer as well as nitrogen. Phosphorous deficiency is not general, therefore, no generalized recommendation can be made. A phosphorous deficiency is indicated by stunted plants and purpling of the leaves. Where this deficiency is present, from 60 to 80 lbs. of actual phosphoric acid will usually be enough to remedy the deficiency. Phosphorous may be needed when high rates of nitrogen are used, although it is not needed with lower rates of nitrogen.

Fertilizer can be applied by broadcasting and discing in prior to planting, by placement at time of planting, by pre-plant application in the bed, or by side dressing after the plant has emerged. When nitrogen is applied at planting time at high rates, it should not be placed too close to the seed. In any case, the fertilizer should be applied before the first irrigation to insure rapid plant development. On light soils split application may be desirable. This is usually done by adding part of the nitrogen to the irrigation water on the second and fourth irrigations.

CULTIVATION

The main reason to cultivate corn is to control weeds. Weeds compete with corn for moisture and nutrients, making their control essential. In general, cultivation should be shallow; deep cultivation will injure the roots of the corn plant. In this area, one to three cultivations is the general practice. Cultivation should be discontinued after the corn is tall enough to be damaged.

IRRIGATION

The corn plant requires large amounts of water for maximum development and growth. From $2\frac{1}{2}$ to $3\frac{1}{2}$ acre feet of water will be used during the growing season. This crop should never be allowed to suffer from lack of available moisture at any time. Leaf curl in mid-afternoon is common during hot summer temperatures. However, leaf curl at noon or before is an indication of a depletion in available soil moisture. This latter condition is undesirable.

Experimental data as well as grower observations show that the best results are obtained from frequent water applications continued until the corn has reached the hard dough stage. At this time, the majority of the kernels will be well dented and the kernels will be hard. Although moisture should never be permitted to become deficient, particular attention should be paid to the plant at tasseling time. At this time, the root system will have become well developed and the plant will be taking moisture from a large area of soil. Therefore, it may be necessary to apply heavier and more frequent irrigations after tasseling takes place.

In general, corn is furrow irrigated in this county. However, there is some experimental evidence that indicates more efficient distribution of water is made to the corn plants when the field is flooded. In trials at Davis, comparing flood or irrigation down the plant row to regular furrow irrigation, yield increases of as much as 50% have been obtained by using the plant row or the flood method as compared to the regular furrow method. Some growers in the county have also experienced the same result, in comparing furrow to flood irrigation.

DISEASES AND INSECTS

Corn smut and fusarium ear rot or pink mold are two serious diseases of corn. These diseases are seldom a serious problem in Tulare County. There is no control for these diseases, as the fungi that cause them live in the soil. Generally, smut will not be as serious if the corn is planted early. Annual rotation of corn aids in the control of smut.

The corn earworm is the principal insect pest of corn in the county. However, this pest does relatively little damage to the grain crop. No control is recommended.

For fields known to contain wireworms, use of Lindane treated seed is recommended. Most commercial seed corn is treated with a fungicide to prevent seedling disease. Treated seed is cheap insurance of a better stand.

HARVEST

Corn for grain can be harvested in several ways. Direct combining is the most common method, since it permits harvest of the grain at a low enough moisture percentage (15%) to be immediately marketed. For this method of harvesting corn, maturity will be reached in about 150 days. Some corn is still picked on the ear by the conventional mechanical corn picker. It is then stored for later use and may be shelled for grain or ground for corncob meal when convenient. Corn harvested by this method, can be safely stored when the moisture content of the grain reaches 25%.

ENSILAGE

Corn for ensilage will be at approximately the right stage for cutting, 110 to 125 days after

planting. A good determination for silage maturity is about 40 days after silking. Corn should then be in the hard dough stage with the kernels well dentated and having a glazed appearance. The lower leaves will normally be turning brown.. Corn for ensilage can be planted up to early July with a good chance of maturing the crop. Rainy weather will not affect the quality of the silage, since it does not deteriorate. However, sloppy field conditions may cause some difficulty. The real danger is from an early frost. Frosted corn should be ensiled as soon as possible and water should be added if the material is too dry for making high quality ensilage.

VARIETIES

Yield results of both grain and silage trials in Tulare County may be obtained by securing a copy of "Hybrid Corn Production Trials" from the Farm Advisors Office.

COST OF PRODUCTION

The cost data study of Hybrid corn production included in this publication is only a sample. The grower should use it only for comparing the data with his own.

2/57

WHAT WILL IT COST TO GROW AN ACRE OF HYBRID CORN

The following costs are based on a yield of 5,000 lbs. shelled corn per acre. Man labor 1.10/hr. 30 H.P. wheel tractor at \$1.80/hr.

	SAMPLE COSTS	
	Per Acre	Per cwt.
PRE-HARVEST LABOR AND MATERIAL COSTS:		
Land preparation: 3 hrs. man & tractor	8.70	
Plant and fertilize (4 row) 2 men and tractor .5 hr.	2.00	
Seed: 16 lbs. @ 25¢	4.00	
Irrigate: 1 pre and 5 crop - 7½ hrs.	7.50	
Water: Power to pump 3.5 ac. ft. @3.00	10.50	
Cultivate: 3x - 1.5 hrs. man & tractor	4.35	
Fertilizer: to provide 150 lbs. Nitrogen	16.50	
Miscellaneous labor & materials	3.00	
Total labor & material costs	56.55	1.13
HARVESTING COSTS		
Picking and hauling: contract	10.00	
Shelling: contract @ \$3 per ton	7.50	
Total harvesting cost	17.50	.35
CASH OVERHEAD COSTS:		
General expense: (5% of labor & Material)	3.70	
County taxes:	6.00	
Miscellaneous repairs, insurance, etc.	2.50	
Total cash overhead costs	12.20	.25
TOTAL CASH, LABOR & FIELD POWER COSTS:	86.25	1.73
DEPRECIATION:		
Irrigation facilities: (original cost \$110)	7.00	
Crop equip.: (except tractor) cost \$17	1.70	
Total depreciation	8.70	.17
INTEREST ON INVESTMENT @5%:		
Irrigation facilities: ½ original cost \$55	2.75	
Equipment: (except tractor) ½ original cost \$8.50	.43	
Land at \$500 per acre	25.00	
Total interest on investment	28.18	.56
TOTAL COST OF PRODUCTION	123.13	2.46