

# Artichoke Plume Moth Control

experiments and field practices during 1949-1957 show value of properly timed parathion treatments and good sanitation

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**The artichoke plume moth—*Platyptilia carduidactyla* (Riley)**—caused crop losses as high as 90% during 1956 and is the most important restricting factor in the production of artichokes.

Records kept in San Luis Obispo County—during a 14-year period—show that the artichoke plume moth has caused annual losses ranging from 10% to 90% with an average of 25%. Other counties report average seasonal losses of from 25% to 75%.

Artichokes planted in 1956—9,400 acres—had a fresh market value of \$3,072,000 and the markets—for frozen artichoke hearts and for a new marinated product—will greatly increase the value of the crop in the next several years.

Factors responsible for severe infestations include continuous artichoke production on the same land, a tendency to grow the crop during the spring and summer months when the moth is very active, poor top disposal, and other poor sanitation practices.

The plume moth lays 70 to 300 eggs—with an average of 170 eggs—on the undersides of the woolly leaves of the artichoke plant. In the spring months they lay eggs also on the fuzzy stems below the buds. Eggs are rarely laid on the artichokes. The small worms hatch in from eight to 14 days and crawl to the bases of the shoots and feed upon the inter-folded new leaves. If no bud is present they bore inside the stems. In the spring the young worms often enter upright buds and mine the outer bracts. Borings inside the stems or buds—black and filled with frass—are characteristic of the plume moth. Large worms may even enter the crowns of the plants.

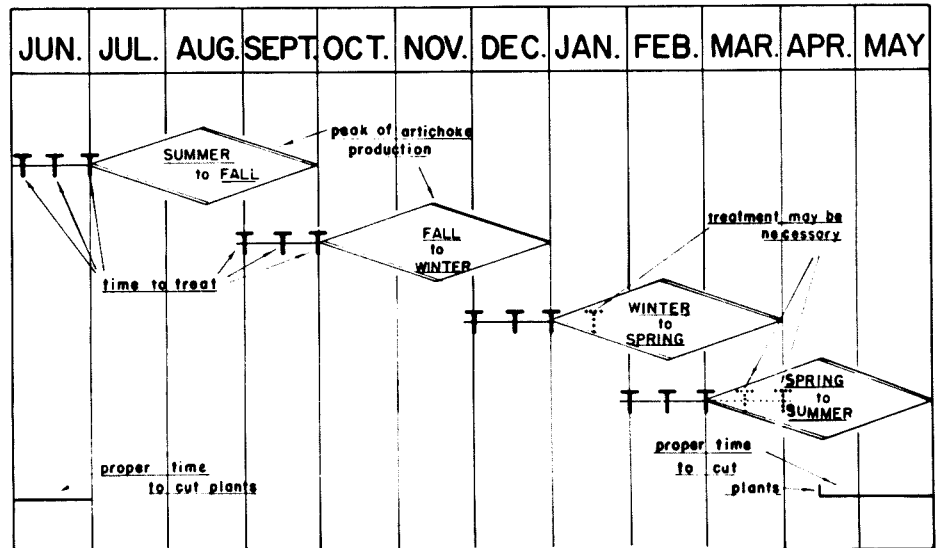
Larvae feed for 36 to 86 days. Pupa-tion occurs in the stems, or on the outer bracts of the buds. Adults emerge 10

to 30 days later and may live for 30 days. A cycle from egg to adult may take from 54 to 140 days depending upon climatic conditions and the season of the year.

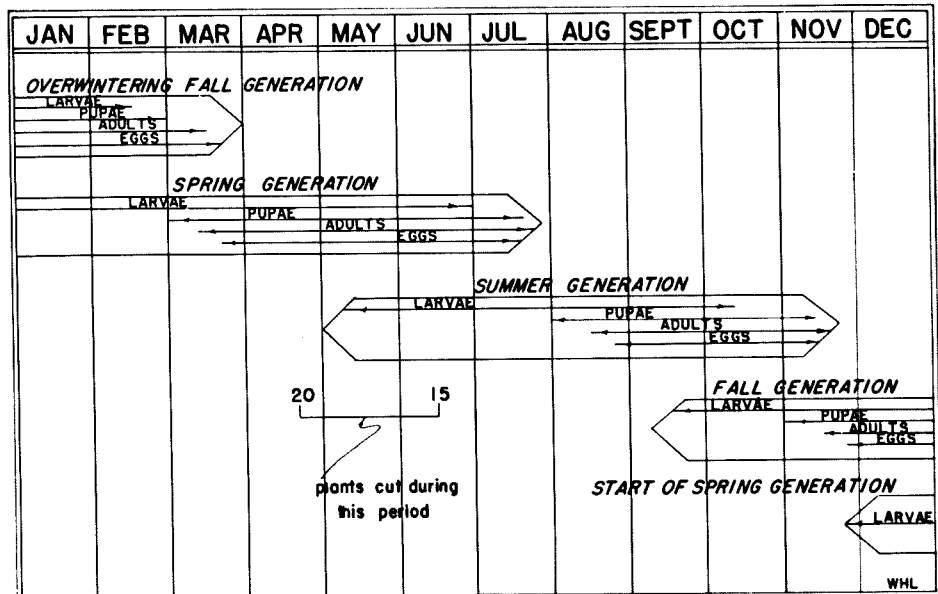
Three overlapping generations of the plume moth every month of the year. If plants are cut off at or below the soil surface during April through June—the usual practice—the summer

generation is distinct. The larvae of this generation attack the leaf petioles, often boring the entire length inside the stems because few buds are produced. The fall generation larvae enter buds as they appear at the bases of the shoots and cause damage until the following February. The spring generation starts the end of November and causes damage until the plants are cut again from April to June.

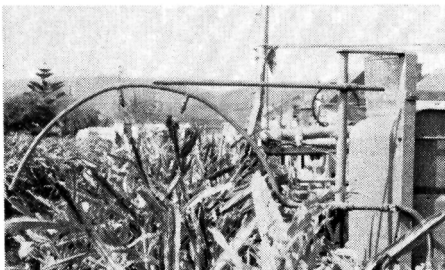
Timing of insecticide applications in relation to seasonal production of artichokes.



Seasonal cycle of the artichoke plume moth.



Power sprayer showing boom adaptation used to spray artichokes.



Experiments and commercial practice have demonstrated the value of parathion—dusts and sprays—for the control of the artichoke plume moth. Control is a matter of proper timing to correspond with the time of peak production of artichokes.

Three applications of parathion timed at 15–20-day intervals—15 to 60 days prior to peak production—are necessary for adequate control. Single applications

applied at random intervals usually give only temporary control.

A peak in production during July to September requires three applications—about June 1, 15, and July 1. A peak crop during October to December requires treatment about September 1, 15, and October 1. A spring peak from March to May requires 3–5 applications starting about February 1.

Generations of the moth can be fol-

lowed closely by watching brood development in cages or by counting the number of eggs per leaf. In San Luis Obispo County a count is made of 10 to 30 leaves cut midway between the oldest and newest leaves on the southeast side of the plants selected at random. Egg counts are usually correlated with current worminess in the fields and worminess 30–60 days following counts. For ex-

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# Artichoke Production

## costs and returns to growers studied in survey conducted at Half Moon Bay

Philip S. Parsons and R. H. Sciaroni

**Producing artichokes** in the Half Moon Bay area during the 1956–57 season cost \$513.36 per acre—\$2.20 per 22-pound box—according to information obtained in a recent survey.

The sample costs in Half Moon Bay are not presented as average for San Mateo County, however, because charges for individual items may vary in different plantings and increased yields would reduce per box costs. A yield of 225

boxes per acre—of 22 pounds each—is considered good but in some seasons yields may be much lower. Under ideal growing conditions a yield of 300 boxes per acre is possible.

To achieve good quality and high yields of artichokes an adequate fertilizer program and an economic control of the plume moth—the most important pest of artichokes—must be maintained consistently.

The cost of developing artichoke plants on the ranches surveyed came to \$61.00 per acre which—spread over a five-year producing life—gives an annual cost of \$12.20. Development costs include:

Make plants .....	15 man hrs.	\$15.00
Planting .....	15 man hrs.	15.00
Truck .....	1.5 hrs.	3.00
Replant .....	3 man hrs.	3.00
Stumping, 1st year ...	5 man hrs.	5.00
Plants .....		20.00
		<b>\$61.00</b>

Other costs were obtained from a number of growers during the survey and a sample schedule of work done, materials used, and prices as of 1956–57 was prepared as shown in the large table at the lower left.

Successful growers of artichokes must be skilled in the cultural and management phases of the enterprise because risk of crop failure—due to frost injury,

Cost of Growing Artichokes in Half Moon Bay Area of San Mateo County  
Yield 4,950 lbs. or 225 (22 lbs.) boxes—1956–57

	Hours per acre				Costs per acre
	Man labor	30 H.P. track tr.	20 H.P. wheel tr.	Pickup truck	
Disk 2X before, 2X after plow .....	2.00	2.00			\$ 7.00
Plow .....	1.25	1.25			4.38
Roll and ditch .....	1.00	1.00			3.50
Irrigate 9X, incl. moving pipe .....	45.00				45.00
Side dress .....	9.00	3.00			16.50
Cultivate with rows 7X .....	5.25		5.25		12.34
Cultivate across rows 2X .....	2.50		2.50		5.88
Hoe .....	5.00				5.00
Dust 8X (machine) .....	4.00		4.00		9.40
Pick, grade, pack and haul .....	58.00			9.00	76.00
Broadcast slug bait .....	1.50				1.50
Cut old growth, 2 men .....	1.50	.75			3.38
Burn old growth .....	5.00				5.00
Plow and ditch for drainage .....	1.75	1.75			6.13
Close ditch (plow) .....	1.25	1.25			4.38
Disk 2X harrow and roll .....	1.50	1.50			5.25
Misc. other labor .....	2.00	.50		.50	4.25
<b>Total cultural and harvest labor costs</b> .....	<b>147.50</b>	<b>13.00</b>	<b>11.75</b>	<b>9.50</b>	<b>\$214.89</b>
Manure .....					25.00
Fertilizer, commercial .....					20.00
Dust, 400 lbs. ....					40.00
Slug bait .....					9.00
Boxes, nails and paper—33¢ per box .....					74.25
Irrigation water—power to pump .....					10.50
<b>Total material cost</b> .....					<b>\$178.75</b>
General expense, taxes on plants and equipment, repairs, insurance .....					35.00
Land rent .....					50.00
<b>Cash overhead costs</b> .....					<b>\$ 85.00</b>
<b>Total cash costs</b> .....					<b>\$478.64</b>
Depreciation on tenant's field equipment .....					16.82
Depreciation of established artichokes, \$61 with 5 year life .....					12.20
Interest on investment in tenant's field equipment .....					5.70
<b>Total overhead costs</b> .....					<b>34.72</b>
<b>Total all costs except management</b> .....					<b>\$513.36</b>

Per Acre Net Returns from Artichokes in 1956–57 at Varying Levels of Yield, Cost and Price<sup>1</sup>

Yield /Acre, and Boxes	Returns and Costs	Price /Box—22 lbs.				
		\$2.00	\$2.25	\$2.50	\$2.75	\$3.00
200	Gross .....	\$400	\$450	\$500	\$550	\$600
	Costs .....	505	505	505	505	505
	Net .....	-105	-55	-5	45	95
225	Gross .....	450	506	563	619	675
	Costs .....	513	513	513	513	513
	Net .....	-63	-7	50	106	162
250	Gross .....	500	563	625	688	750
	Costs .....	521	521	521	521	521
	Net .....	-21	42	104	167	229
275	Gross .....	550	619	688	756	825
	Costs .....	530	530	530	530	530
	Net .....	20	89	158	226	295
300	Gross .....	600	675	750	825	900
	Costs .....	538	538	538	538	538
	Net .....	62	137	212	287	362

<sup>1</sup> Variations in costs between various levels of yield caused by differences in harvest cost.

heavy rainfall, and artichoke plume moth damage—is high in the production of artichokes.

Factors influencing net returns to growers are shown in the above single column table. A yield of 225 boxes per acre would require a seasonal average price of slightly more than \$2.25 per box for the grower to break even with production costs.

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