

CROP REPORT of AGRICULTURAL PRODUCTS

of

SAN LUIS OBISPO COUNTY

1940

Compiled by

County Agricultural Commissioner's Office

Thomas Chalmers

Commissioner

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TOTAL VALUATIONS

1930 - 1940

	ANIMAL INDUSTRY	FIELD CROPS	FRUIT-NUT CROPS	VEGETABLE CROPS	TOTAL
1930	4,063,100	1,827,400	603,000	2,529,000	9,022,500
1931	2,786,400	1,145,796	636,100	2,572,600	7,140,896
1932	1,777,600	1,530,800	480,300	2,634,600	6,423,300
1933	1,804,800	1,810,000	458,100	2,409,000	6,481,900
1934	2,216,600	1,762,900	365,800	2,519,100	6,864,400
1935	3,707,600	3,173,200	285,400	2,706,100	9,872,300
1936	4,174,100	3,539,600	571,100	2,815,000	11,099,800
1937	5,070,800	4,082,700	1,529,000	2,804,700	13,487,200
1938	5,830,100	3,632,300	576,000	3,610,700	13,649,100
1939	4,891,500	3,098,200	655,200	3,256,000	11,900,900
1940	5,373,500	3,201,900	540,900	2,803,100	11,919,400

ANIMAL INDUSTRY
1940

VARIETY	NUMBER ANIMALS	TOTAL YIELD	VALUATION 1940	VALUATION 1939
Beef Cattle	37,022		2,838,400	2,769,600
Cows (Butterfat)	23,500	3,289,760 lbs.	1,107,500	950,600
Calves (Veal)	11,200		149,000	134,800
Chickens (Eggs)	270,000	3,240,000 doz.	648,000	408,500
(Meats)		295,000 lbs.	47,200	88,700
Hogs	22,130		249,000	218,100
Turkeys (Meats)		867,300 lbs.	173,500	158,500
(Eggs)		306,000 doz.	42,800	48,800
Sheep	9,940		76,000	62,700
(Wool)		92,000 lbs.	21,200	17,900
Goats (Butterfat)	800	26,312 lbs.	18,400	22,300
(Kids)			2,500	11,000
TOTAL			5,373,500	4,891,500

FIELD CROPS
1940

VARIETY	ACREAGE	TOTAL YIELD	VALUATION 1940	VALUATION 1939
Wheat	128,200	1,067,500 Cwt.	1,380,100	1,508,700
Sugar Beets	4,400	53,700 Tons	418,300	435,900
Hay (Grain)	34,000	41,200 Tons	412,000	411,300
Barley	27,100	405,600 Cwt.	344,700	319,800
Alfalfa (Hay)	4,100	17,400 Tons	174,000	188,200
Beans	8,900	53,653 Cwt.	156,800	102,300
Small Whites		29,800 Cwt.	93,900	35,200
Pinks		22,460 Cwt.	59,500	59,600
Misc.		1,393 Cwt.	3,400	7,500
Oats	5,900	66,200 Cwt.	57,600	84,500
Flower Seed	290		43,500	40,000
Potatoes	200	33,000 Cwt.	42,900	
Misc.	8,600		172,000	207,500
TOTAL	221,690		3,201,900	3,098,200

**FRUIT and NUT CROPS
1940**

Variety	ACREAGE	YIELD Tons	VALUATION 1940	VALUATION 1939
Almonds	15,396	1,192	429,100	546,200
Walnuts	666	195	45,600	30,600
Grapes	708	1,072	21,400	27,900
Pears	446	600	15,000	16,500
Apricots	162	180	10,800	11,600
Apples	258	350	7,000	9,600
Miscellaneous	642	250	12,000	13,000
TOTAL	18,278	3,739	640,900	665,100

VEGETABLE CROPS
1940

VARIETY	ACREAGE	TOTAL YIELD	VALUATION 1940	VALUATION 1959
Peas	4,533	118,500 Cwt.	697,600	715,200
Lettuce	3,518	516,800 Cr.	539,200	577,700
Cauliflower	2,716	805,100 Cr.	441,700	587,300
Tomatoes	1,552	355,200 Lugs	268,200	479,400
Celery	441	213,700 $\frac{1}{2}$ Cr.	265,400	283,300
Broccoli	1,082	190,300 Cr.	247,400	239,200
Artichokes	489	63,500 Bx.	79,300	121,100
String Beans	274	22,500 Cwt.	78,700	29,800
Cucumbers	68	67,400 Lugs	40,400	29,100
Brussels sprouts	141	20,700 Bx.	51,100	45,400
Anise	143	24,900 Cr.	27,400	9,900
Carrots	119	22,400 Cr.	26,900	52,700
Squash	46	15,800 Lugs	11,800	7,500
Misc. Vegetables	148	266 Cars	49,000	78,400
TOTAL	15,269		2,803,100	3,256,000

COUNTY AGRICULTURAL COMMISSIONER
SAN LUIS OBISPO COUNTY, CALIFORNIA
ANNUAL REPORT FOR THE YEAR 1940

To the Honorable Board of Supervisors,
San Luis Obispo County, California.

Gentlemen:

The legislature has written into the Agricultural Code of this State statutes which define the duties of the Agricultural Commissioner.

It may be said that the chief aims of this office, as prescribed by this Code, are (a) to prevent the introduction into and spread within the county of pests; (b) to direct the control of specific pests found in the county when united action may be needed; (c) to inspect certain crops to determine whether minimum requirements prescribed by the Code have been met before sale to the public is made; and (d) to perform the numerous functions and services directly or indirectly defined by the Code and those which may be requested of the office.

Although these groups describe the chief aims, they are not a satisfactory basis for handling the work. We have learned that if related subjects are grouped and assigned to one or more inspectors, the work of the office is accomplished at a higher rate of efficiency. By this arrangement each inspector can confine his attention to a limited field and become thoroughly familiar with it. Under this plan (1) all work relating to rodent and weed problems has been grouped and assigned to two inspectors; (2) those problems which apply to insect and disease have been given to a third inspector; (3) the inspection of fruits, nuts, vegetables, eggs and honey to determine that legal requirements have been met, has been given to a fourth inspector; (4) miscellaneous activities may be handled by any of four inspectors. To E. K. Griswold and R. E. Talbert has been assigned the rodent and weed work, and to R. M. Drake the insect and disease work. J. B. Gottfried handles the standardization work. In a few cases it has been necessary to give these inspectors work outside of their fields.

Thirteen years ago, or when the present commissioner was first employed, it was not possible to carry out all the functions delegated to the office by the Agricultural Code. It was then evident that if the inspectors who were available were assigned to all duties, no definite accomplishment would be possible, particularly as the work had not been properly organized. The decision was therefore made to confine the attention of the staff to those duties which were most pressing in the county.

From this beginning, extension to other activities was made as rapidly as each phase could be properly organized. The extent of the work now handled by this Department may be seen from the following brief outline.

- I RODENTS AND OTHER ANIMALS WHICH ARE BEING COMBATED, INCLUDE:
- (A) Ground Squirrels, by the use of poisoned grain and fumigants.
 - (B) Bobcats and Coyotes, by trapping.
 - (C) Destructive Birds, by instruction in protective measures.
 - (D) Kangaroo Rats, Rats and Gophers, by instruction in methods or by preparation of baits.
- II THE PROGRAM AGAINST WEEDS CONSISTS OF TWO PHASES:
- (A) To prevent the introduction and spread of weeds:
 - (1) Agricultural seeds are inspected for noxious weed seeds.
 - (2) Seed screenings must be free from serious weed seeds or processed to destroy their viability.
 - (3) Crops likely to be infected with specific weeds cannot be moved from the property.
 - (4) Equipment such as threshers, cleaners, etc., must not be used on properties infected with certain noxious weeds.
 - (B) To control the following nine weeds by suitable programs:
 - (1) Puncture Vine
 - (2) Yellow Star Thistle
 - (3) Purple Star Thistle
 - (4) Texas Blue Weed
 - (5) Russian Knapweed
 - (6) Johnson Grass
 - (7) White Horse-Nettle
 - (8) Hoary Cress
 - (9) Morning Glory
- III WORK AGAINST INSECTS AND DISEASES ALSO CONSISTS OF DIFFERENT PHASES:
- (A) To prevent the introduction and spread of pests,
 - (1) Incoming shipments of plants are inspected for pests.
 - (2) Outgoing shipments are certified as to pest condition.
 - (3) Movement of crops may be restricted from properties infected or infested with a pest not of common occurrence.
 - (B) To record the status and distribution of pests, and the effect of insecticides and fungicides on pests and hosts,
 - (1) Field surveys and observations are made.
 - (C) To control specific pests,
 - (1) Pest control operators are licensed.
 - (2) Apiaries of the county are inspected for bee diseases.
 - (3) Owners of grain warehouses are aided to control grain pests.
 - (4) Grasshoppers are controlled whenever necessary.
 - (5) Celery-free period is maintained to control the mosaic disease.
 - (6) Neglected orchards are being removed.
- IV THE INSPECTION OF FRUITS, VEGETABLES, NUTS, EGGS AND HONEY TO DETERMINE THAT THE MINIMUM REQUIREMENTS HAVE BEEN MET INCLUDES:
- (A) Three reports of the vegetable acreage for harvest are prepared annually.
 - (B) Inspection work is done chiefly in the field.
 - (C) Certificates are issued on certain crops.
- V MISCELLANEOUS DUTIES INCLUDE:
- (A) Records of fruit and nut acreage by age and variety are kept.
 - (B) A crop report of acreage, yield and valuation is prepared annually.

RODENTS AND OTHER ANIMALS WHICH ARE BEING COMBATED:

(A) The Control of the Ground Squirrel

The Ground Squirrel Situation in the County

There is a need for revising the present rodent control program to meet situations which have gradually developed during the period of its operation.

Thirteen years ago, or before the present program was started, the annual loss from this rodent exceeded \$500,000. There was no organized effort. The situation was serious. Most farmers were not able to get satisfactory control. Many types of poisons were used, and baits treated with them were applied repeatedly, which only furthered the poor results already obtained. When the present program was first undertaken, it was necessary to urge farmers to discontinue their applications of poisoned grain in order to increase the period between treatments. By increasing the period between applications, marked improvement in the rate subsequently applied baits are taken, would result.

During each of the past twelve years, the preferred bait has been determined and single applications of it have been made at a time when best results might be obtained. This policy has increased speed of acceptance of the selected baits until this factor is generally not a problem in this work.

However, in recent years, even with this improved acceptance, results have continued to fall away. In 1928, the first year of the present program, one pound of thallium grain treated only 2.98 acres. Through results obtained in subsequent years the spread between pounds and acreage increased until, in 1932, one pound of thallium grain treated 31.19 acres. Since then the acreage has fluctuated from approximately this amount to a figure somewhat less. An attempt was made to correlate this fluctuation with the size of the litters; since it had been stated that as the population is reduced by control measures, the number in the litters increased. Figures kept for nearly ten years indicate no such correlation.

A summarization of the poisoned grain used in 1939 showed: out of the 1,800,000 acres treated, 150,000 acres required fifty per cent of the total poisoned grain used. It is apparent from these figures that the squirrel population in certain limited areas had not diminished in the same proportion as in the balance of the county. In other words, even though the same poison had been used only once each year, the time was reached when the toxic agent produced a lower kill thereafter. This condition is more pronounced in some limited areas. Ground squirrels which have recovered from a sub-lethal dose of any poison evidently remember the effect for a long time, and appear able to develop a method to resist it, and to pass this ability on to their progeny.

Records kept on the number of ground squirrels which were active in three colonies at different times of day show that the number present throughout the day or on different days is not uniform. An examination of the stomachs and the pouches of ground squirrels obtained in poisoned areas shows a marked variation in the quantity of poisoned grain taken. Consequently, by this variability of activity, some squirrels will get a big part of the poisoned grain applied, leaving a sub-lethal dose for the squirrels feeding later.

In attempting to correct the situation which exists in the county, the main object of this program must be kept in mind, as there is a limit to the amount which may be spent on such a program. The extent of damage in relation to the value of crops raised per acre must be taken into consideration. The per acre cost of a single application of poisoned grain is low, and generally below the damage which would have resulted to crops if the application had not been made. If a greater efficiency is desired than is possible from a single application of poisoned grain, the cost of the work for the additional efficiency should not exceed the damage expected. The situation which occurs in the limited areas aggregating 150,000 acres may be corrected only by extending the period between applications of poisoned grain to two years or possibly more; or by a specialized program. Under a specialized program the cost per acre will naturally exceed the amount normally required, and may even be beyond the gross income per acre. On the other hand, to omit the treatment of poisoned grain in any year in such areas might result in severe losses.

This was the situation which existed in this county at the beginning of this year. After considering these various angles, we decided to carry out the following program during 1940:

1. To reduce the number present in the 150,000 acres where poisoned grain has not been effective in recent years,
 - a. A portion of this acreage will be treated by fumigants.
 - b. That portion of the 150,000 acres which cannot be gassed this year, will be given an additional year's rest from poisoned grain wherever possible.
2. The balance of the area normally treated, or 1,650,000 acres, will not be treated entirely with thallium grain this year.
 - a. Those portions which are under economic control will also be omitted.

Work with Carbon Bisulphide in 1940

Following the above outline, the El Posar district--or the area bounded by the Salinas River, the Paso Robles-Creston Road, and the Rocky Canyon Road--was selected for an intensive program with carbon bisulphide. This treatment was also given to the properties on the coast located between Cayucos and Villa Creeks. This work got under way about February 16, with approximately 125 men supplied by the WPA office. The men were divided into crews of 6 to 10 men, with a county man in charge of each unit.

In this particular work all burrow openings were closed a short time prior to treatment. The application of carbon bisulphide was made chiefly with the Demon Rodent Gun, a new applicator used for the first time in the county. Part of this area was treated a second time by this crew of men.

A summary made of the daily records kept by the crew shows that 532,495 burrow openings were closed prior to treatment, and that 258,594 holes were treated. As the burrow openings located on some properties were not closed before treatment, the saving was the greatest further inland.

Another computation made shows that carbon bisulphide cost 2.6 times the thallium grain cost per acre, and a single application of carbon bisulphide took 6.7 times longer. Therefore, the limiting factor in the extensive use of carbon bisulphide according to these figures is the time element.

In addition to the area treated by WPA laborers, many properties outside of these districts were gassed. This work was continued to late fall, to determine whether the Demon Rodent Guns extended the period of use for carbon bisulphide. Excellent results were obtained throughout the year whenever this new applicator was used. The period for use of this material therefore has been greatly extended, and it can now be used in the summer and fall if the soil is without cracks to permit the escape of the gas; also the Demon Rodent Gun economizes on material, as the number of holes treated per gallon is greater.

The quantity of carbon bisulphide used during the past three years follows:

1938-----941 gal.

1939-----3,568 gal.

1940-----7,631 gal.

Work with Thallium Grain in 1940

In addition to our desire to restrict the use of thallium grain during 1940 for reasons previously stated, there were two other factors which limited its use this year. The price of thallium sulphate had doubled, and work with this material had to be delayed until summer, as satisfactory results could not be obtained until that time. In the Coast district it was not possible to get the desired results at any time.

For these and the other reasons mentioned, the quantity of thallium grain used this year was greatly curtailed. A comparison of the amount used in each of the past three years follows:

1938-----	83,698 lbs.
1939-----	106,588 lbs.
1940-----	30,902 lbs.

Work with Strychnine Grain in 1940

As conditions this year were more favorable for work with strychnine grain, it was used in a large part of the county, particularly in the cattle raising districts.

Results from strychnine grain are likely to be lower than those from thallium grain. Nevertheless, the improvement in results of the latter material which should follow next year will justify its use this year.

The increase in this work may be seen by a comparison of the quantities used in 1938, 1939 and 1940:

1938-----	12,432 lbs.
1939-----	18,210 lbs.
1940-----	60,468 lbs.

(B) Coyotes and Bobcats

The trapping of coyotes and bobcats is a cooperative project between this office and the Fish and Wildlife Service of the Federal government.

The trapper is assigned to the different districts according to needs based upon the number of requests received. Although a larger part of the county was covered in 1940 than in 1939, there were fewer animals trapped. The smaller number caught should not be taken as an indication of the condition of the county, as the trapper

was instructed to concentrate on districts and not number, and also to give special attention to properties where losses were occurring. Very often some time was required to trap the animal or animals causing the loss. Areas adjacent to a district in which the trapper was working were also explored to determine the immediate need of that area or the necessity for future work there.

It is our desire to work out a plan of operation in which the trapper can be located in a district at a particular period when the need of his services is the greatest.

During March control of predators by poisoning was tried out on the Chinoas Ranch on the Carim Plains. The ranches of this district consist of considerable acreage, and this method was tried out to determine whether it can be safely used over the entire Carim Plains district. If it is possible to do so, the area could be gone over much more rapidly than by trapping. Beginning about December 15, 1940, this program will be repeated and extended to other properties and owners who desire this service.

A summary of the work for 1940 follows:

Date	Area Covered	Coyotes - Bobcats
12/1 3/5	Creston-Brandon-Imette	62 - 5
3/6 3/17	Chinoas	4 - 1
5/18 5/18	Hansen	19 - 9
8/14 8/19	Coast (San Simco Cr. to County Line)	64 - 18
8/20 10/31	Coast (Caynes to San Simco Cr.)	38 - 8
11/1 11/30	Pozo	10 - 12
	Poison work	197 - 53

(C) Birds

The killing of birds that may be destroying crops is not encouraged by this office. Whenever destruction is occurring, measures which will repel the birds from the crop are encouraged. Poisoning methods are used only in cases where losses may be severe and where measures to repel the birds have been tried and found ineffective.

Annually, damage is caused by linnets to fruit-tree buds and ripening fruit, by horned larks to lettuce and bean crops, by woodpeckers and blue jays to maturing almonds. However, the extent of damage by these and a few other species varies from year to year. Often a combination of factors such as occurred this year with almonds results in severe losses. The chief offender against the almond crop this year was the Lewis Woodpecker. Other species of woodpeckers and blue jays also caused some damage, but the destruction by these varieties did not compare with that caused by the Lewis Woodpecker.

A light acorn crop evidently encouraged these birds to move into the orchards where the nuts were maturing, for their food supply. As the almond crop was light, losses were severe, approximately one-fourth of the entire crop being destroyed. Owners of orchards in outlying districts in many cases reported total losses. The damage is estimated to be in excess of \$60,000.

The only method which proved to be of any value in keeping off the birds was the patrolling of the orchards with a shotgun during the months of July and August.

An automatic exploder was tried out in three different locations, but it proved to be of no value against woodpeckers.

(D) The Control of Other animals

No program is carried out for the control of rats, kangaroo rats or gophers, other than to explain or demonstrate methods to farmers and, in some cases, to prepare the bait for them.

Losses from kangaroo rats are confined to approximately one-fourth of the county--in the Carisa Plains adjacent to Kern County, where these rodents have caused excessive damage to pasture for many years. Kangaroo rats are easily controlled, and damage has been practically eliminated whenever rolled barley treated with strychnine poison, as prepared and recommended by this office, is used.

II THE PROGRAM AGAINST WEEDS

The Weed Situation in the County

A few years ago, this office presented at meetings of farmers the various details which might be included in a weed program. It was our hope that suggestions would be made which could be added to the program then in operation. From these meetings we concluded that although the interest in weeds is increasing steadily, the ideas of farmers are at great variance on this question. There is no agreement among them as to the weeds which should be combatted or the action which may be necessary to prevent their introduction and spread.

The present program against weeds retains practically all features which have been carried out by this office for many years; and others which have been suggested to us and considered to be workable.

Work against weeds has been divided into two parts, the preventive phase and the control phase. Of the weeds present in the county nine have been selected for consideration of control.

A control program against Puncture Vine, Yellow Star Thistle and Purple Star Thistle has been in operation for several years. The only known infestation of Texas Blue Weed has been treated and is believed to have been eradicated. Since Russian Knapweed, Johnson Grass and White

Horse Nettle infest a small aggregate acreage, work on their control has been undertaken.

Two of the nine weeds selected, Morning Glory and Hoary Cress, involve such an acreage that their control cannot be considered for the present.

In addition to these nine weeds, there is some interest in the control of Bermuda Grass, Wild Liquorice, Distaff Thistle, Lupinus sp., Russian Thistle and *Malacothrix saxatilis*.

(a) Preventing the Introduction and Spread of Weeds

To check the introduction of weeds before they become established in an area, examination of crops or things which might be the means of spread should be made. The introduction and subsequent spread of two of the worst weeds, Morning Glory and Hoary Cress, might have been prevented if an adequate inspection service had been established many years ago.

By inspection, weeds such as Russian Knapweed, Johnson Grass and White Horse-Nettle, which infest only a few acres, might be checked in their spread; while noxious weeds such as Camel Thorn, Leafy Spurge, Klamath Weed and others which do not occur in the county, may be kept out entirely.

(1) Inspection of Agricultural Seeds

All agricultural seeds offered for sale must be free from certain noxious weed seeds. In order to familiarize seedsmen with the requirements of this county, the following noxious weeds have been selected which must not be present in agricultural seeds:

(a) Acreage in county now infested large to medium size:

Hoary Cress	-	<i>Lepidium draba</i>
	-	<i>Lepidium repens</i>
	-	<i>Hymenophyssa pubescens</i>
Morning Glory	-	<i>Convolvulus arvensis</i>
Puncture Vine	-	<i>Tribulus terrestris</i>
Yellow Star Thistle	-	<i>Centaurea solstitialis</i>

(b) Acreage in county now infested small:

Johnson Grass	-	<i>Holcus halepensis</i>
Purple Star Thistle	-	<i>Centaurea calcitrapa</i>
Russian Knapweed	-	<i>Centaurea repens</i>
Texas Blue Weed	-	<i>Helianthus ciliaris</i>
White Horse-Nettle	-	<i>Solanum elaeagnifolium</i>

(c) Acreage in county now infested none:

Austrian Field Cress	-	Roripa austriaca
Camel Thorn	-	Alhagi camelorum
Canada Thistle	-	Cirsium arvense
Carolina Horse-Nettle	-	Solanum carolinense
Creeping Sow Thistle	-	Sonchus arvensis
Klamath Weed	-	Hypericum perforatum
Leafy Spurge	-	Euphorbia esula
Perennial Pepper Cress	-	Lepidium latifolium
Quack Grass	-	Agropyron repens
Scarlet Gaura	-	Gaura coccinea
Wavy-Leaved Gaura	-	Gaura sinuata

Shipments of agricultural seed consist mainly of lots of sudan grass, alfalfa and vetch seed. Two lots of sudan grass were rejected for the presence of Morning Glory and one for Johnson Grass seeds. A lot of seed screenings which was to be used for reseeding the range was also rejected due to the presence of Yellow Star Thistle seed.

(2) Seed Screenings

Since the addition of the seed screenings provisions to the Agricultural Code, many lots have been sampled and analyzed by the seed laboratory of the State Department of Agriculture for this office. These reports give a complete list of the weed seeds present in each lot examined. The information obtained from these reports substantiates what has already been learned, that very few lots of seed screenings have any feeding value and that most lots consist chiefly of weed seeds. Most farmers, upon being advised of the long list of weed seeds which their screenings contain, generally choose to destroy the entire lot. Since few farmers now show any inclination to claim their screenings, some cleaning establishments are securing their signatures to a release at the time of delivery so that the company may destroy the refuse. Only 22 farmers made a request for an inspection of their screenings so that they might be released to them.

(3) Movement of Agricultural Crops

With the exception of Morning Glory, this office has now a list of the properties infested with the nine weeds. Of the nine, Hoary Cress is the only weed where any action against crop movement is considered advisable at this time. Owners of properties where this weed is present have been warned against planting of crops which might become contaminated with it. These owners have cooperated toward reducing the danger of spread of this weed through the movement of crops.

Farmers or dealers who obtain alfalfa hay or other products from other counties have been encouraged to consult us about the danger of the material being contaminated with any noxious weeds.

Where a danger exists a certificate is required from the county of origin. In some years heavy movement of alfalfa hay is made to this county from Kern County to supplement the shortage of pasture. Practically no movement was made this year.

(4) Movement of Equipment

No definite policy has yet been worked out about the movement of threshers, cleaners and other equipment to or from properties.

(B) The Control of Weeds

(1) Puncture Vine - Tribulus terrestris

(2) Yellow Star Thistle - Centaurea solstitialis

(3) Purple Star Thistle - Centaurea calcitrapa

These three annual weeds have been grouped, as the control of them is generally handled by the same men, and often at the same time.

Work against these three weeds was started in the latter part of April and continued until the middle of October. Unusually favorable weather encouraged high seed germination of Puncture Vine, Yellow Star Thistle and Purple Star Thistle over a longer period than normally. This prolonged period of seed germination greatly increased the problem of control of these three weeds, as it was necessary to go over the infested areas an additional number of times.

Our effort toward control was simplified by assistance given by landholders this year. Many of the landholders followed our recommendation regarding the use of a cultural program, the planting of row crops or late crops.

The cheapest method of controlling these weeds is clean cultivation, or any method which rids the area as completely as is practicable of all weed growth. With hand methods, if other weeds are present, the chance of missing plants of these pests is greatly increased. To rid areas of weed growth, many were burned off. By spraying with oil or by mowing infestations before surrounding areas are dry, the area can be put into condition for burning earlier than normally. In addition to the above methods, hand hoeing, hand hoeing and sacking, oiling, oiling and burning, were used against these weeds.

The quantity of diesel oil used for the control of Puncture Vine, Yellow Star Thistle and Purple Star Thistle totalled 8,228 gallons.

Puncture Vine now infests approximately 600 acres, while Yellow Star Thistle can be found on 800 acres of land and Purple Star Thistle on 24 acres.

The Yellow Star Thistle infestation is found mostly on private property; while the Puncture Vine infestations are located chiefly on public property such as county roads, railroad rights of way, parks, etc.

(4) Texas Blue weed - Helianthus ciliaris

The only known infestation of Texas Blue Weed was treated with sodium chlorate two years ago. No plants have shown up in the area since that time.

(5) Russian Knapweed - Centaurea repens

There are 32 infestations of Russian Knapweed, totalling 26 acres, in this county. This weed is a serious potential pest for this county. During past years, different methods have been tested for its control, and we have concluded that under our conditions, sodium chlorate is the best material. Approximately two acres were treated with this material this year.

(6) Johnson Grass - Holcus halapensis

Approximately two of the twenty-three acres of Johnson Grass were eradicated during the year; by a cultural program.

(7) White Horse-Nettle - Solanum elaeagnifolium

Additional tests were made for a method which might be used for the control of this weed. Less than three acres are infested with white Horse-Nettle.

(8) Morning Glory - Convolvulus arvensis

The aggregate acreage of morning Glory in this county probably exceeds 5,000. Most of the infestations are found on dry farmed land where high expenditure could not be made for its control. Although various chemical methods have been tried and control is possible with some of them, their cost is too high for general use.

The only method which may find a place in this county is probably a cultural program. In order to demonstrate the feasibility of controlling Morning Glory by this method, four plots were laid out at Nipomo. These four plots have been cultivated at the following rate: one plot has been cultivated at each emergence of the Morning Glory plants; a second plot, six days from each emergence; a third, twelve days from each emergence; and a fourth, eighteen days from each emergence.

(9) Hoary Cress - *Lepidium* sp.

More interest is shown by farmers in the control of Hoary Cress than all other weeds combined. None of the chemicals which have been tried out have given sufficient results.

This weed, which infests approximately 1,000 acres, is also found on land where high outlay for materials could not be made.

III WORK AGAINST INSECTS AND DISEASES

(A) To Prevent the Introduction and Spread of Pests

(1) The Inspection of Incoming Shipments of Plants

Inspection of plants and plant material arriving in the county from other counties and states is made to prevent the entrance of agricultural pests. This work is done chiefly at freight, express and post office terminals before the plants are released to the consignee. As a major part of these shipments are received during the winter and spring months, daily calls are made at these points to prevent delay in delivery.

2,650 shipments of plants were inspected during the year. These shipments consisted of the following numbers of plants: 18,660 deciduous fruit and nut trees; 495 citrus trees; 1,695 bush berries; 171,145 strawberry plants; 127,111 annual plants; 25,666 ornamentals; and 62,432 bulbs.

In addition, all ships arriving at Port San Luis from foreign ports were boarded and inspected for restricted plants and plant material. During this period 46 ships were inspected at Port San Luis.

(2) Certification of Outgoing Shipments

Certification is necessary for certain shipments going to another state or to a foreign country. Recently two large shipments of wheat going to Mexico required certification that the grain originated in an area free from certain pests. One of the objects of survey work is to obtain information regarding the presence or absence of particular pests so that certificates may be issued whenever necessary.

(3) Properties under Quarantine

The only quarantine against any property is the agreement which exists between this office and four owners of a farm infected with Southern Root Rot disease. This infection consists of approximately $\frac{1}{2}$ acre, and is the only one known to be present here. The area was treated two years ago, and is still isolated.

(B) The Status and Distribution of Pests and Hosts, and the Effect on them of Insecticides and Fungicides

The 1940 season has been unique in that conditions have been unusually favorable for a large build-up of insect pests and plant diseases affecting agricultural crops. Since many of the more serious diseases of plants are carried by insects, a twofold effect has been felt by growers of crops such as celery, peas, sugar beets and tomatoes.

A large number of surveys has been conducted during the year to determine which pests and diseases are of primary importance, and to study the relationships between them and the affected crops. Current insect and disease control practices have been noted and practical help given in many instances. This has varied from instruction in vegetable seed treatment to the recommendation of insecticides and fungicides for particular needs.

Some experimental work has been done with insecticides and fungicides when the opportunity arose. This office has cooperated with State and Federal agencies in certain insect and disease problems requiring special attention.

(1) Summary of Surveys and Observations in the Field

(A) Pests of General Nature

Cutworms

Damage from the variegated cutworm has been widespread. A large variety of crops has been attacked, including alfalfa, beets, celery, green almond nuts, lettuce, mustard, peas, petunias, potatoes, sweet peas, tomatoes, and vegetable seed beds. The occurrence of two overlapping generations has resulted in their presence throughout most of the season.

Instruction and assistance have been given some 20 growers in the mixing and application of nearly a ton of poison bait material for their control. Experiments have shown that a simple bait of bran, sodium arsenite and water is very effective in controlling this species of cutworm. Parasites and a disease affecting cutworms have also aided in their control.

Garden Centipedes

The abundance of garden centipedes and the resulting damage to sugar beets and certain other crops afforded opportunity for some experimental work on possible control measures.

The application of dichlorethylether in spots which previously required replanting several times gave sufficient results to warrant further tests of this new material.

(b) Pests of Fruit and Nut Crops

Almonds

An apparent virus disease of almonds tentatively called "ring spot mosaic" has been under observation in the Estrella, Paso Robles and River Grove districts. Infected trees have been observed throughout the season and all diseased trees in one area marked to enable detection of further spread. A scarcity of blossoms, failure to set a normal crop of nuts, poor foliage and twig dieback appear to accompany the disease.

The State Bureau of Plant Pathology and University Experiment Station at Riverside are also interested in this disease.

A predominance of brown rot over shot hole occurred this season, but both diseases were of minor importance. Drouth-weakened trees were favorable hosts for mites.

Walnuts

Bacterial blight of walnuts was prevalent in seedling orchards and a high percentage of nuts was affected. Pest control activities were restricted to dusting for the walnut aphid in some groves. Conditions were not favorable for the build-up of this pest to the degree experienced in previous years.

Pears

Damage to fruit buds by the pear leaf blister mite was severe in several orchards, resulting in a light crop. Russeting and deforming of fruits were also noticeable. A change in present spray schedules will be necessary if damage is to be prevented.

Codling moth damage in some unsprayed orchards ran as high as 70 per cent. In one instance, the use of an incompatible spray mixture for the control of this insect apparently caused pronounced burning of fruit.

(c) Pests of Vegetable Crops

Artichokes

Plume moth damage varied from 5.0 to 26.8 per cent with a combined average loss of 14.3 per cent for the season. It is becoming evident that differences in cultural practices affect the degree of infestation the following year. Current practices include cutting and burying the old plants immediately, cutting and burying after drying two to three weeks, discing under plants, and merely "stubbing out" the older stalks.

Light trap catches on one ranch comprising one night's catch for two pans included 380 beneficial parasites of the plume moth and but 12 plume moths, 10 of which were males.

Celery

Conditions favorable to leafhoppers have resulted in the spread of celery yellows from a large reservoir of diseased weeds and flowers in the Arroyo Grande Valley.

Crucifera

Aphids and cabbage worms have been persistent pests of sprouts, cauliflower and broccoli throughout the season. The use of derris, pyrethrum or pyrethrum-Lethane preparations seems preferable in certain instances to increasing the nicotine content of home-made nico-dusts applied under conditions too cool for effective results.

Lettuce

Corn earworm damage to lettuce presented a serious problem this year, resulting in several rejections. Observations made of the habits, distribution and possible control measures were not very encouraging. One company concluded that the use of a .75 per cent rotenone dust was of value.

Slime, tip burn, downy mildew and drop were present and resulted in losses in some fields. This could have been avoided in certain cases by proper selection of variety.

Some experiments were conducted in Oso Flaco using two bait formulae for cutworms and also a fungicidal dust for downy mildew.

Peas

Early-planted bush peas were severely affected by *Ascochyta* blight which resulted in the plowing up of some fields. The following possible control measures were brought out in discussions with interested growers:

1. Do not save seed from infected fields.
2. Plant as late as possible to avoid severe infection during the heavier rains.
3. Plant as nearly as possible at the same time in the same district.
4. adopt a plan of rotation for the entire district, using at least a 4-year period between pea crops.

Damage from thrips and leaf miners, and the spread of mosaic by aphids had a pronounced effect on pole peas. The acreage of this crop is continuing to decrease as a result of these and other pests.

Tomatoes

Curly top (Western yellow blight) resulted in the loss of over 200 acres of tomatoes. Other fields developed 10 to 25 per cent diseased plants. Continuous infection by beet leafhoppers throughout the season precluded roguing and replanting as a control measure. Spotted wilt, another virus disease, was also common in many fields. This alone and in combination with mosaic resulted in much unmarketable fruit. Bacterial canker was of minor importance this year in most fields. Instruction in seed treatment and seed bed management for control of canker has been given a number of growers in past years.

Corn earworms and aphids required dustings which are not ordinarily considered necessary.

(d) Pests of Field Crops

Sugar Beets

During the grasshopper surveys large numbers of beet leafhoppers were seen on filaree and other foothill vegetation. Movement of these into sugar beet fields resulted in a high per cent of the curly top virus disease in many fields. Earlier planting and the more general use of resistant beet seed appear to be essential in this area.

Cutworms and garden centipedes caused considerable damage to beets, requiring the replanting of over 300 acres. Sugar beet nematodes were found in a surprisingly high percentage of fields examined. This pest lowered the yield on infected ground to 5 tons or less per acre. There is a need for proper rotation with non-susceptible crops.

Potatoes

Bacterial ring rot, a serious disease of potatoes, was found to be present to a limited extent in fields of growers operating in the Oso Flaco area. Late blight was severe in two fields where aeroplane dusting was done too late to be effective. Tuber moths and cutworms did some damage in shallow-planted potatoes.

Grain and Hay

Late-planted wheat in the Paso Robles and Shandon areas was affected by the heaviest attack of stem rust in years. An appreciable reduction in yield resulted from dwarfed and

shriveled kernels. Early-planted wheat headed out well in most instances despite the rust attack. Rust damage was negligible in the Carisa Plains, but reduced yields occurred on the east side of the plains from lack of moisture. Yields were good on the west side, where the larger portion of the acreage is located.

Mildew of barley was general in the more humid areas. Scald, loose smut and covered smut were of minor importance.

Wild and cultivated oats were badly rusted. Increased tonnage from oats and vetch mixtures offset the more severe effect of oat rust under these conditions.

(e) Pests of Ornamentals

The further planting of Monterey cypress appears to be futile in this county because of the cypress canker disease. The destruction of many trees by this fungus indicates that conditions are highly favorable here for its spread. Replacement with certain known non-susceptible evergreens appears to be the only solution.

(C) To Control Specific Pests

(1) Pest Control Operators

Practically all spraying and dusting work is done by the growers. Therefore no license was issued during the year.

(2) Inspection of Apiaries for Bee Diseases

Inspection of bees for American Foulbrood was confined to small apiaries. Of the 12 apiaries inspected, representing 593 colonies, 50 diseased colonies were burned in accordance with the bee inspection law. Gratifying results are being obtained in the control of bee diseases.

Ten apiaries totalling 3,164 colonies moved into the county and 4 apiaries totalling 2,962 colonies moved out of the county.

(3) The Control of Pests in Warehouses

The need for fumigation of grains and stored products has arisen on several occasions, but work in this direction is handicapped by lack of adequate fumigation facilities throughout the county.

Methyl bromide was used successfully in box car fumigation of weevil-infested grain and also small lots of empty sacks and seed beans.

(4) The Control of Grasshoppers

The 1939 poisoning campaign, aided by natural enemies and an abundance of vegetation this spring, eliminated the necessity for a control program this year. Surveys were made of eggs, nymphs, and adults both independently and jointly with the Federal grasshopper investigator. Observations were made in the Edna, Chorro, Coastal, Santa Margarita, Templeton, Pozo, Shandon, Carisa Plains and Cuyama districts. Information obtained is recorded on report sheets which are kept in permanent files.

Greatest activity has been noted in the Cayucos Creek, Green Valley, Carisa Plains, and Cuyama districts. Egg laying by the devastating grasshopper began two months earlier than last year. Some poisoning work may be required in these areas but a general infestation such as occurred in 1939 is not expected.

Adequate bait materials are stored in a local warehouse to enable any emergency poisoning work.

(5) The Control of Celery Mosaic

Results of the celery-free period of February 10 to March 20 were sufficient to justify a continuance of this program to control celery mosaic in the Arroyo Grande Valley. Certification of celery plants from out of county is being required to insure their origin from mosaic-free areas. Growers are at present working out the most convenient period for next season. No indication of mosaic has been found in the Oso Flaco district.

(6) The Elimination of Neglected Orchards

There were in excess of 5,000 acres of neglected orchards in this county in 1936 when the program for their elimination was first undertaken. A check made this year indicates that the acreage of neglected fruit trees has been reduced to 1,816. Most of the reduction was accomplished through this office.

IV THE INSPECTION OF FRUITS, VEGETABLES, NUTS, EGGS AND HONEY OFFERED FOR SALE

(A) Surveys of Planted Vegetable Acreages

Three reports are prepared each year to show the acreage of the various vegetables which will be harvested during the following four-month periods. These reports are prepared for distribution to growers, shippers, transportation companies and others who may desire them. The total vegetable acreage for each of the three periods is:

January 1 to May 1.....	8,161
May 1 to September 1.....	3,469
September 1 to December 31.....	<u>5,116</u>
Total for year.....	16,746

(B) The Inspection Work

As most shipments to market are made from the field, inspections are made there. A brief report of some of the problems which are encountered, follows:

Artichokes

Although worm damage was quite high during the year, growers were able to meet the requirements by culling carefully. As a result, no reconditioning was necessary. In addition, attention was given to the sizing and packing of artichokes during the shipping season.

Brussels Sprouts

As the section in the Agricultural Code on Brussels sprouts is new, it was necessary to familiarize growers with the requirements. Each grower was visited and the requirements were explained in detail. As a result of this educational work, very few rejections were made.

Cauliflower

The cauliflower produced this year was of good quality. Growers had no difficulty in meeting the requirements.

Celery

Celery of good quality was produced during the summer and fall. The fall celery was attacked by insects, making frequent inspections and some reconditioning necessary.

Lettuce

A great part of the lettuce leaving the county was inspected in the field before shipping to market. Due to climatic conditions and insect damage the quality of the spring and fall lettuce was not very good, making it necessary for growers to cull carefully. During the year, 202,160 crates of lettuce were inspected. Of this number, 6,780 crates were rejected.

Bush Peas

Due to unfavorable climatic conditions, the bush pea crop was very poor this year. Considerable inspection work was necessary to keep the growers from shipping low quality peas to market.

Potatoes

Due to the large amount of insect damage, the potatoes in the Oso Flaco district were inspected to see that they met the requirements of the grades marked. Of the 6,300 sacks of potatoes inspected, 464 sacks were rejected.

Tomatoes

As the growers were not familiar with the grades set up by the prorate committee, various growers were informed of the requirements. The tomatoes this year were badly affected with disease and insect damage, making it necessary for growers to cull heavily to avoid rejections.

Pears, Apples and Other Fruit

There were inspected 2,950 lugs of pears. This fruit also had to be culled heavily to meet the grade required.

Eggs

Since handlers of eggs became thoroughly acquainted with the law, the quality has greatly improved. Of the 2,774 dozen eggs inspected, 154 dozen were rejected, and these for minor reasons only.

(C) Certification of Certain Crops

Much of the lettuce leaving this county for other markets within this state was inspected, and a certificate issued to indicate that the requirements of the Agricultural Code had been met.

These certificates were first issued by this office about three years ago to growers who requested them. This service has become very popular with the growers as it enables rapid movement to market. This work has practically eliminated rejections on the market. As a result of the interest in this service this year, the lettuce prorate committee requested that all lettuce shipped to Los Angeles market from Santa Barbara or San Luis Obispo counties be cleared in this manner.

As a result, during the year 792 certificates were issued to growers.

V MISCELLANEOUS FUNCTIONS


(A) Records of Fruit and Nut Acreages

In accordance with the requirements of the Agricultural Code, this office keeps a record of the county's fruit and nut acreages by age and variety. These records were brought up to date during the year.

(E) Crop Report of 1940

An annual report is prepared for distribution showing the acreage, yield and valuation of the various agricultural industries in this county. This report will be ready during the forepart of January, 1941.

Respectfully submitted,


Thos. Chalmers, Agricultural Commissioner,
San Luis Obispo County.