Penalty for private use to avoid payment of postage, $300

C. B. Hutchison
Director.

Free—Annual Report or Bulletin or Report of Progress
Permit No. 1127

California AGRICULTURE

Progress Reports of Agricultural Research, published by the University of California College of Agriculture, Agricultural Experiment Station

Vol. 1 | February, 1947 | No. 3

Irrigated Pastures May Be Favorable to Livestock Parasites

M. A. Stewart

Certain internal parasites inhabit and reproduce in the bodies of sheep and cattle. The young, undeveloped parasites, excreted by the animal, find conditions in irrigated pastures well suited to their development.

Conditions Fostering Development

Irrigated pastures provide moist conditions and even temperatures at the base of plants where parasites thrive.

The plant growth protects the immature parasites from the drying effects of direct sunlight.

More animals per acre are carried on irrigated pastures than on non-irrigated lands, so the parasite population is higher.

Irrigated pastures are commonly used for young animals, which are more susceptible to parasites than are older ones, and consequently are greater carriers.

Control Measures

In spite of these dangers, irrigated pastures can be used to advantage if the operator will take certain routine measures to suppress parasites and prevent infection.

Coccidiosis. This disease is produced in sheep and cattle when the wall of the intestine is invaded by small one-celled parasites belonging to the genus **Eimeria.**

The most constant symptom is "bloody scours." Certain other conditions may produce similar symptoms but when such scours occur, coccidiosis should be suspected and a definite diagnosis should be made by a competent person.

Prevention is best assured by determining, as far as possible, that animals purchased come from "clean" ranches. When this is not known, the new animals, especially the young ones, should be quarantined for approximately two weeks before they are placed with other stock.

Under feed-yard conditions, infections in lambs may be prevented by mixing ground crude sulfur with the feed.

(Continued on page 2)

Seek Answers to Nitrogen Needs of Orchards in State

E. L. Proebsting

A high percentage of the peach orchards in California need nitrogen; a low percentage of the pears and prunes need it, and the other fruits and nuts fall in intermediate positions.

Properly used, a pound of actual nitrogen gives about the same response whether from manure or commercial fertilizer, and irrespective of whether it was given as a nitrate compound or as an ammonium compound. There might be secondary effects due to the form used, but generally, nitrogen from any standard source is satisfactory.

Time of Application

The time of application is a question involving more qualifications to the answer. In earlier studies, two situations were observed.

In one, an adequate amount of nitrogen was given annually to maintain a satisfactory level. Time of application was a minor factor after the first year.

In the other situation, encountered chiefly in shipping fruits where a moderate level is desired to encourage early maturity, timing is of much greater importance.

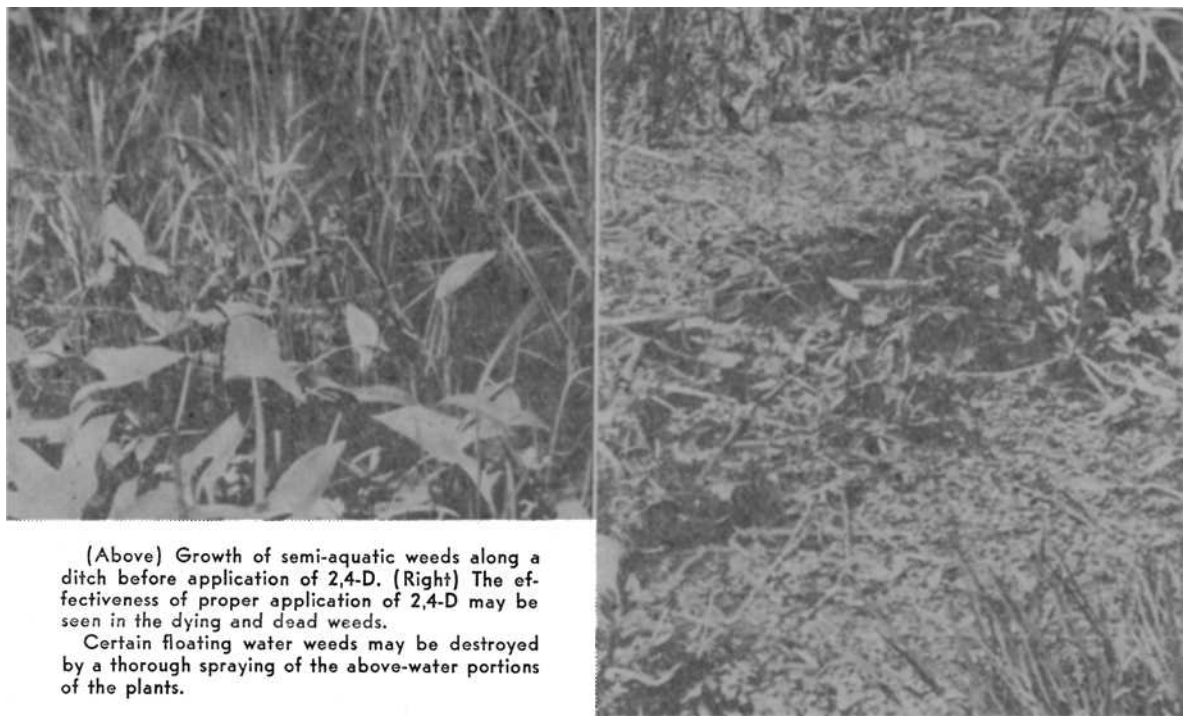
(Continued on page 3)

2,4D Valuable as Weed Killer When Properly Used But Can Be Detrimental To Soil and Crops if Mishandled

W. A. Harvey

Available in dry powder form and as liquid preparations the commercial 2,4-D is readily dissolved or emulsified in water to form a spray solution to be applied in sufficient volume to get distribution of the chemical to all the weeds.

Applications by airplane may require only 15 gallons of concentrated solution per acre, while a field sprayer may apply 100 to 200 gallons per acre of a more dilute solution. The amount of chemical to use in this amount of solution will depend upon the weed problem, and will vary from three-quarters of a pound to three pounds of 2,4-D acid per acre.



(Above) Growth of semi-aquatic weeds along a ditch before application of 2,4-D. (Right) The effectiveness of proper application of 2,4-D may be seen in the dying and dead weeds.

Certain floating water weeds may be destroyed by a thorough spraying of the above-water portions of the plants.

Ordinarily the manufacturer's recommendations as to the amounts to use can be followed.

For controlling mustard and radish in grain fields about three-quarters of a pound of acid is required per acre and the cost for the chemical will be two to three dollars per acre.

For morning-glory control, where one and a half pounds per acre is the usual rate, the cost will be four to six dollars per acre. For some of the more resistant weeds, where three pounds may be required, the cost will be eight to twelve dollars per acre.

The cost of application usually is in the neighborhood of two dollars per acre.

Mode of Action

On most weeds the action of 2,4-D is much slower than that of other weed killers. Four to eight weeks may be required for the weeds to die down completely. In hot weather the effect is more rapid than in cool weather.

The first effect to be observed on sprayed plants is a twisting and bending of the stems and leaves. Some plants show a drying of the stem and leaves until the tops are completely dead. Others may remain green for several weeks, showing a swelling of the stems, with cracks or splits developing and callus tissue forming. Some of the woody plants change leaf color, becoming yellow or red as though it were autumn, before the leaves are dropped.

Seriously affected plants may have roots that are enlarged and spongy or are completely dead, several weeks after treatment.

Responses of Different Weeds

Of the perennial weeds tested, morning-glory (European bindweed) is apparently one of the easiest to kill. Hoary cress (white top) is somewhat more difficult but numerous kills of above 95 per cent with one spray have been obtained.

Several semi-aquatic weeds including cattail, tule, bur-reed, and kelp can be killed by proper applications of 2,4-D even when they are rooted below the water surface. The addition of three gallons of diesel oil per 100 gallons of spray is of some value in obtaining a kill of these species, possibly because of better penetration of the waxy cuticle of the weed. The ester preparations appear to be especially effective on these same species.

Floating water weeds such as water hyacinth, yellow water-weed, and **Hydrocotyle** were easily destroyed by a thorough spraying of the above-water portions of the plants.

Plants that form rosettes are particularly susceptible in that stage. Other plants should be young and growing vigorously with a well developed leaf surface. Old mature plants respond slowly, or not at all. All plants are more easily killed in the small seedling stages provided the application can be made at that time.

Effect on Grasses

Grasses, in general, are much more resistant to 2,4-D than are broad-leaved plants. This difference makes it possible to use the chemical for the eradiaction of such lawn weeds as dandelions and plantain. Bluegrass and ryegrass are more resistant than the bent grasses or red top. The spray will kill clovers and black medic as well as the weeds.

Turfs, grass pastures and grass seed fields may be treated using one and one-quarter pounds of 2,4-D acid per acre in 100 or 200 gallons of water but should not be sprayed when the grasses are blooming.

Cereal grains are also more resistant than many of the grain field weeds, and 2,4-D is being widely used as a selective spray in grain fields. The usual rate has been one-half to three-quarters of a pound of 2,4-D acid per acre. With a ground rig this amount of acid is applied in 100 to 125 gallons of water. Some injury to the grain has been noted when treatment was made on very young seedling grain but applications to grain that was four to six inches high have been without damage.

Apparently wild radish, star thistle, and mustard are readily killed by applications that ordinarily cause no damage to grain. Among the crops that have been successfully sprayed are oats, barley, and wheat. Milo and corn have been treated successfully using one to one and one-quarter pounds per acre.

Dusts containing 2,4-D will soon be available for treating grain fields. They must be used with care to prevent drift to other crops.

Applications by airplane of 15 gallons per acre of a solution containing about one and one-half pounds of 2,4-D were effective in controlling arrowhead lily, water plantain, some of the sedges, and other aquatic species infesting rice fields. Where the water was low at the time of spraying there was some damage to the rice but fields sprayed when the checks were full of water showed no injury.

Effect on Soil

Several instances of soil sterilization from the use of 2,4-D have been investigated. Broccoli, cabbage, sugar beets, tomatoes, beans and other crops have been damaged when put out in fields previously sprayed with 2,4-D. In several cases excessive amounts of the chemical had been used and in most cases the fields were dry from the time of application of the 2,4-D until immediately before planting the crop.

Tests indicate that the 2,4-D breaks down or leaches out of warm, moist soils within 30 to 60 days but may persist in cool, dry soils for six months or longer.

Flood irrigation following an application of 2,4-D would help to remove the residual chemical, particularly during the summer when the soil is warm. Winter rainfall is sufficient in many areas to remove the chemical and permit spring or summer seeding of most crops.

Precautions

In spite of the fact that 2,4-D has promise of being one of the most important chemicals in weed control, there are certain precautions in its use that should be observed.

1) Since the material is new and not thoroughly tested, it should be used with discretion and without the expectation of miracles from its use. The action is slow and a month or more may elapse before the tops are completely dead, and even a longer time before the roots disintegrate. In almost all cases, two sprays will be necessary to kill all the plants because some will be missed in the first spraying and new plants may come up from lateral roots not killed by the first spray. The sprayed area should be closely watched and any new growth or regrowth sprayed

(Continued on page 3)

Economic Outlook For The California Dairy Industry

Extract from forthcoming Experiment Station Circular No. 366, "The Dairy Situation in California, 1947."

James M. Tinley

The immediate and long-time outlook for the California dairy industry, though fraught with some dangers and difficulties, is distinctly favorable.

Population and Buying Power

It is estimated that California's population will reach 10 million before 1950.

Some decline in buying power from the 1946 level is to be expected. This will tend to reduce the per capita consumption for some dairy products. The total volume of consumption of dairy products, however, will not be greatly reduced because of the growth of population. Even in 1945, all consumer needs for such products as market milk and market cream were not fully met because of shortage of supply.

Production

It is probable that milk production will continue to expand for several years but at a slower rate than the population growth. California's deficit position as regards milk production will thus become more pronounced.

Utilization

A growing proportion of all milk fat sold by farmers will be used in market milk, market cream, and ice cream. Although the volume of production of evaporated and condensed milk and of powdered whole milk will probably decline below the peaks reached during the war years, these products will utilize a substantially greater proportion of California's output of milk fat than before the war.

It is unlikely that butter and cheese together will utilize much more than 10 per cent of all milk fat produced annually. California will have to import a growing proportion of its consumption needs of butter and cheese.

Prices

Beginning in 1947, a decline in prices of milk and dairy products is to be expected. On the other hand, most costs are likely to remain fairly rigid.

Dairymen would be well advised to give greater attention to reduction of indebtedness and increase in efficiency of operation.

James M. Tinley is Professor of Agricultural Economics, Agricultural Economist in the Experiment Station, and Agricultural Economist on the Giannini Foundation.