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IRRIGATION OF POTATOES

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The production of maximum yields and high quality potatoes under irrigation depends largely on the proper application and use of water. The quality of the crop is not injured by water if wisely and properly used. In some districts of the State four or five applications of water may be sufficient, whereas in other districts six or more may be necessary to produce maximum yields. In any district the number will vary from year to year with the variation in rainfall and seasonal conditions.

Owing to the variation in the water-holding capacity of the different soils and the influence of temperature, rainfall, and other seasonal conditions, it is impossible to prescribe dates when the first and last irrigations should be applied or the number of irrigations that should be given. As a result of 14 years of study at Greeley, Colo., larger yields were consistently obtained when the proper soil moisture was maintained to enable the plants to make a continuous, vigorous growth throughout the growing season, or up to the time the tubers had reached full size. It was found that frequent light applications of water were preferable to infrequent heavy ones.

Apply the first water whenever the plants seem to require it. Then the soil should be kept moist by light to medium-light irrigations until tubers are fully grown. Irrigation operations should be suspended in time to allow the crop to ripen before harvest. The ideal condition is to have all the soil except the top of the ridge continuously moist. The adequacy of moisture in the soil may be determined by examination of the soil 6 or 8 inches beneath the top of the ridge, by the condition of the plants, and by the color of the foliage. Plants properly supplied with moisture should appear vigorous and have foliage color typical of the variety. Lack of moisture in the soil causes the plants to become dark, whereas an over supply causes the foliage to assume a lighter color than is normal.

In most of the irrigated sections of the State the irrigation water is run in furrows between the rows or between pairs of rows, depending on the slope of the ground, length of row, and type of soil. These furrows should be comparatively deep and narrow so that the water may be applied to the soil below the tubers. On steep slopes small streams are used, to avoid washing. On flat land and heavy soils the irrigation furrows must be deep and broad so the water will not reach the top of the ridges but can be forced quickly to the far end of the rows. The length of run should be governed by type of soil; on lighter soils where the water percolates into them more rapidly, shorter runs should be used. If deep furrows are used there is less tendency to pack the soil in the rows.

If late blight should occur in the irrigated fields in 1943 every effort should be made to reduce the spread of spores to the tubers by irrigation water. Light irrigations with good drainage will reduce chances of tuber infection and

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decay. Deep irrigation furrows should also help. Since late blight spores die quickly after coming in contact with dry soil it is believed that growers should avoid irrigating at night or early in the morning. It may even be necessary to suspend irrigation operations during the period that the plants are affected. This practice will reduce the total yield but a larger percentage of marketable tubers may be produced.

LATE BLIGHT CONDITIONS

L. A. Schaal*

The time for the appearance of "late blight" has arrived. The name "late blight" suggests that the plants are affected late in the season or late in their stage of growth. However, they may be attacked early in the season but usually become infected after they have reached the stage where the tops are of sufficient size to offer some shade and consequent higher moisture conditions around the base of the plant.

Weather conditions to date have not been favorable for an outbreak of late blight. The high day temperatures tend to prevent infection of and subsequent development on the leaves. Since a great deal of infected seed was planted this season it is only reasonable to assume that some infection will occur. The seriousness of the disease will depend on, first the weather conditions and second, the immediate and effective spraying of the fields with Bordeaux mixture.

A careful watch is being made for the first appearance of the disease. All growers are urged to examine the lower leaves of the plants periodically, especially those growing in low wet places in the fields, looking for the water soaked areas on the lower leaves, the lower side of which may be covered with a white mold. When these symptoms are observed the County Agent's office should be notified immediately and a careful check will be made to verify the presence of late blight. Spraying or dusting for control should be started immediately upon determining that the disease is present.

Fields near places where old rotted tubers were dumped last spring are most likely to show the first infection. These dumps often are the source of early infection.

Many growers are applying a spray or dust of copper arsenate for flea-beetle control and are building up copper on the plants which is a good preventative measure for late blight. We should not, however, depend on this spray or a dust to control late blight. Thorough spraying or dusting with copper bearing materials preferably liquid Bordeaux Mixture is required to check the disease.

Late blight is not as difficult to control as are some other diseases of potatoes but the necessity of thorough and timely spraying as soon as it appears, cannot be stressed too much.

In cases where sprayers are not available, dusting is the next best thing. Get in touch with your county agent or the Colo. Agr. Exp. Station for recommendations as to the use of copper dusts.

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Remember that late blight develops rapidly during cool wet weather. Look for it during such climatic conditions and report the first appearance of the disease. This is important since it gives your neighbor who may not yet have it, time to get into his field and spray or dust before it gets started.

THE POTATO FLEA BEETLE IS THE CHIEF CONCERN OF MANY POTATO GROWERS
IN COLORADO NOW THAT THE PSYLLID IS BEING SATISFACTORILY
CONTROLLED

L. B. Daniels

Colorado potato growers are well aware of their insect and disease problems. The development of a general spray program for the control of the important pests of potatoes, started in 1932, has reached a point where most growers recognize the value of spraying. The control of psyllids through the use of lime-sulfur spray is effective. The chief concern for those of us working on potato insects is the solution of the potato-flea-beetle problem.

This insect has been a serious pest in some sections of the State for 30 years. Its chief damage is not to the growing tops of the potato plant, as it is in northern states, but to the tubers where worm-tracked tubers are responsible for many low-grade tubers in the harvested crop.

Four and five thorough applications of insecticide to late planted potatoes have been found necessary to attain control of the flea beetle. The grower is dealing with the adult insect feeding on the vine, but the chief injury is from the eggs the adult lays under ground. From these eggs worms hatch and feed on the tubers. Thus it is doubly important that a definite, thorough spray program be followed.

There are a number of conditions which favor serious flea-beetle injury. High moisture in the potato field is particularly conducive to flea-beetle injury whether it is due to poor drainage, heavy vine growth, a heavy soil, or heavy irrigation.

Potatoes planted in late May or early June in heavy soil, are most likely to be severely worm tracked. On these plantings applications of spray or dust are absolutely necessary. The plantings made the second and third week in June occasionally get by with very little flea-beetle injury if at least three sprays are applied. This is because in an average year only one brood of flea beetles develop. The peak in egg laying in the first brood is reached in early July. In 1941 in eastern Colorado, a distinct second brood began to develop in late August, which required additional applications of insecticides.

The use of zinc arsenite has been recommended for the control of potato flea beetle. This material works well with the lime-sulfur used for the control of psyllids. The formula recommended is 5 pounds of zinc arsenite and 2 1/2 gallons of liquid lime-sulfur to 100 gallons of water, applied at the rate of 125 gallons to the acre to maintain coverage on the growing potato plants.

Complete coverage of the potato foliage is extremely important. This requires that a pressure of at least 300 pounds be maintained. Close attention should be given to the manner in which the spray is being placed on the vines. The lower spray nozzles should be turned up at a 45-degree angle so that the lower edge of

the cone of spray catches the bottom leaves. The two lower nozzles should not work opposite each other but should be staggered. These adjustments mean the maximum swirling and tipping action to the plant, with the result that very satisfactory coverages are obtained.

Coverage can be estimated by examining the wet foliage after the sprayer has passed over the plants. The grower should strive to obtain a complete coverage of the foliage. Spray applications should be made at 10-day to 2-week intervals. The number of days between applications is usually regulated by irrigation schedules.

A definite spray program properly timed, with four or five applications through the season, will materially reduce the amount of worm track. It has been found that experimental plots sprayed three times had 48 percent U.S. No. 1 tubers, while plots sprayed four times produced 74 percent and plots sprayed five times yielded 86.8 percent U. S. No. 1 tubers. The importance of late applications of insecticides is becoming clearly defined in experimental tests for the control of flea beetle.

- HE'S IN THERE
PITCHING TOO!



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