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SPUD NOTES

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RING ROT SURVEY

W. F. McGee

Bacterial ring rot was found to be prevalent in many potato fields last August. Examination of fields indicated that this disease was again increasing. A survey of the ring rot situation was deemed advisable. The survey during early September was made to determine the sources through which ring rot free seed had become infected. Two seed sources were selected and inspections were made in fields planted from these two sources. The two seed sources were selected first, because these sources had a ring-rot-free history during the last three seasons; second, all seed from these lots was planted within a single district; third, both single-drop seed and cut seed were planted; and fourth, all cut seed was cut over four different rotary, power-driven knives.

When a plant was found showing ring-rot symptoms, the tubers were dug and examined. Stem smears were also made and read, using the gram stain method for identification. When bacterial ring rot was found in the field a further check was made to determine the source of contamination. Information obtained by this survey shows that extreme care must be used in the handling of seed. A summary of the survey reports as made by W. J. Henderson, D. P. Glick, E. W. Bodine, and W. F. McGee shows that:

Storage and Equipment

1. A source of ring rot free seed is essential. This is important since ring rot is primarily a seed-borne disease which cannot be eliminated by seed treatment.

2. When ring-rot-infected potatoes are handled in the same cellar where disease-free seed is stored or will be stored, it invariably becomes a source of infection.

3. Equipment used for handling ring-rot-infected potatoes and then used for handling ring-rot-free seed became a positive source of infection. Equipment such as graders, cutting knives, and planters was found to carry ring rot from one lot of seed to another.

The survey also shows that a grower having potatoes infected with bacterial ring rot on the premises, even though he uses every precaution in handling new seed, is very likely to infect the new seed.

Cutting Knives

The cutting knives were sterilized by boiling water and the seed was limed immediately after cutting. One knife was used for cutting seed only from one source of disease-free seed. Fields planted from seed cut by this knife were found to be free of bacterial ring rot.

Other knives were used for cutting seed infected with bacterial ring rot and also for cutting ring-rot-free seed. Fields planted from seed from the ring-rot-free source and cut by these knives were found in many cases to show symptoms of this disease. Further investigation revealed that contamination was very likely from the floors and tables over which the potatoes were handled and not from the circular cutting blade.

The following precautions are suggested for handling seed stocks to prevent infection:

1. Buy Colorado Certified Seed.
2. Do not keep ring-rot-infected potatoes on the premises.
3. Disinfect cellars and all equipment before storing or handling ring-rot-free seed.
4. Cut with a sterilized cutting knife.

(Methods and materials to be used in sterilizing cellars and equipment will follow in a later edition.)

THE COLORADO ROTARY KNIFE

W. J. Henderson

The principal means of transmitting the causal agent of bacterial ring rot of potato is the blades of knives used for cutting seed tubers.

Experimental work has definitely proved that the seed pieces of 10 healthy tubers may become infected by cutting them with a knife blade which has previously been used to cut through one ring-rot-diseased tuber. Therefore the importance of cutting seed tubers with a disinfected blade is quite evident.

The "Colorado Rotary Knife," a device for cutting seed tubers, is constructed so that the knife blade is kept constantly disinfected by rotating it in a 5-gallon vat of either corrosive sublimate (1 oz. to 3½ gal.) or boiling water. If corrosive sublimate solution is used it must be kept at the proper strength, or if boiling water is used it must be kept boiling. When these precautions are not taken the knife will become contaminated and spread ring-rot bacteria to healthy seed pieces. When properly used this rotary knife not only prevents knife transmission of the ring-rot bacteria but it also speeds up the operation of cutting seed potatoes.

Plans for constructing and operating the "Colorado Rotary Knife" are now ready for publication and will soon be available at your county extension agent's office. These plans will also be attached to the next issue of "Spud Notes."

AVAILABLE HEAT SOURCES FOR BOILING WATER DISINFECTION OF THE CUTTING KNIFE

Dudley P. Glick (April 1942)

The following recommendations have been designed to keep water boiling in a metal tank of 3-gallon capacity (e.g., 6" x 12" x 9"), without insulation.

(1) Electricity

General Electric Calrod Immersion Heaters:

Kw.	Volts	Cat. No.	Price	Ship.Wt.	Diam of pipe thread	Interior length	Overall length
0.75	115	15X822	$9.25	2 lbs.	1-1/4"	8"	11-½"
0.75	230	15X823	9.25	2 lbs.	1-1/4"	8"	11-½"

It may be desirable to control such heating unit with a snap switch. General Electric recommends switch "Arrow Cat. No. 6216", at $1.80.

(2) Butane Gas (Bottled Gas)
A circular burner is priced at $5.00; a bar burner at $7.00.
25-pound cylinder at $2.00; 100-pound cylinder at $6.00

The company may supply tanks and regulators without charge except for gas.

100-pound cylinder contains 23 gallons at 4.4 pounds per gallon

Butane contains 104,000 B.T.U. per gallon.

Burners may be had at almost any rated capacity; those recommended used 8,000, 10,000, or 15,000 B.T.U. per hour.

(3) Gasoline
Information supplied by Mr. Pollard, heating engineer, Monte Vista.

A gasoline pot heater, capacity 1-gallon, such as is used to melt lead, may be had at about $8.00. One filling will probably last one-half day.

NOTES: Electricity most suitable provided wiring is sufficiently heavy. Some will use 115v., others 230v. Heater inserted in bottom of tank is about 90 percent efficient. If gas or gasoline is used, there is greater portability but some care must be applied to protect wooden framework from excess heat of burners. Any of these methods will work.

KEEP WATER LEVEL UP - KEEP WATER BOILING

THE DO'S AND DON'TS IN RING-ROT CONTROL

W. A. Kreutzer and John G. McLean

Do's

1. Use the best seed available
   If possible use certified seed.
2. If you are a seed grower, we recommend the use of ultraviolet light for checking your seed stocks.
   Discard all cut seed pieces showing any fluorescence under the light. This helps eliminate ring rot as well as virus diseases, fusarium, and blackleg infections. Several seed growers in the San Luis Valley are using this method very effectively.
3. Use the Colorado disinfected rotary knife in cutting seed.
   We know that ring-rot bacteria are spread from seed piece to seed piece by the cutting knife. The spread of infection will not occur if the automatic disinfected rotary knife is used. This rotary knife should be constructed so that it will run through a 5-gallon tank of either corrosive sublimate solution (1 oz. to 3½ gal.) or boiling water. If the corrosive sublimate is used, replace the solution in the 5-gallon tank after each half-day's cutting.
4. Use a cup type of assisted-feed type of planter.
   Any planter which injures the seed pieces will spread ring rot from seed piece to piece.

5. Avoid unnecessary bruising of seed potatoes at harvest. Ring-rot bacteria will enter wounds in the tuber.
6. Seed growers: store seed potatoes in clean, tight bins.
7. When in doubt, ask your county agent. He can help you prevent ring rot.

Don'ts

1. Use just any seed when good seed is available.
2. Use the old-style knife-in-the-block butcher knife.
3. Allow water to go below the boiling point if the rotary cutting knife set-up is used; or
   Fail to replace corrosive sublimate solution at the proper intervals, if the rotary knife is used.
4. Use formaldehyde solutions or other disinfectants which have not been recommended.
5. Use a picker planter.
6. Bruise seed potatoes unnecessarily at harvest.
7. Store seed potatoes in dirty bins.
8. Kid yourself. Ring rot can still cause a lot of damage in the State of Colorado.

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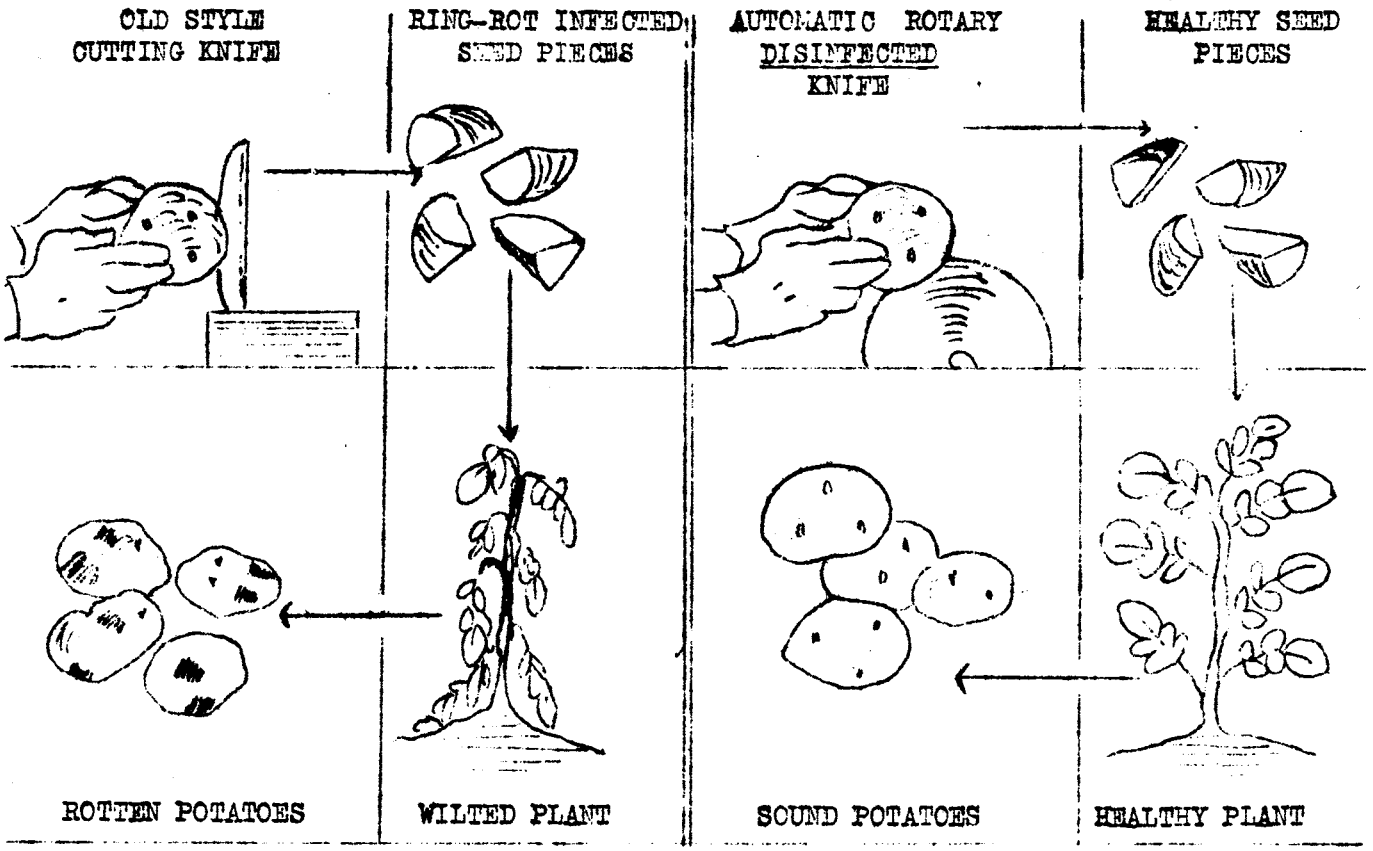

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