

# Control of . . .

## RHIZOPUS SOFT ROT

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Rhizopus soft rot, a serious breakdown problem in sweet potatoes during marketing, can be substantially reduced by use of the fungicides Botran or SOPP, when treatment is accompanied by proper handling practices.

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**D**URING THE PAST FEW YEARS two chemicals, SOPP (sodium-o-phenylphenate) and Botran (dicloran), have been registered for use in controlling *Rhizopus* soft rot of sweet potatoes. These two chemicals were tested in San Bernardino County during the fall season, 1963; spring, 1964 and 1965; and in Merced County in the fall, 1964.

### Southern California tests

Sweet potato roots of the Velvet and Jersey varieties were obtained from grower cooperators near Chino, California. All roots were washed free of dirt and treated within a few hours after harvest. The roots were randomly selected for each treatment and then dipped in one of the fungicides for 10 to 15 seconds. Some of the SOPP treatments were rinsed immediately after dipping. Fungicide residue was determined by analyzing the roots 24 to 48 hours after treatment. After two weeks in storage (in wooden boxes in an unheated shed) the roots were checked for breakdown. If any part of the root showed breakdown, it was considered rotted.

### Botran treatments

Table 1 summarizes the results of four experiments using Botran as a fungicidal dip for sweet potato roots. Botran was

used at the rate of 1.5 lbs (50% wettable powder) per 100 gallons of water. The total weight of all roots in the four experiments was 1,715 lbs. Velvet roots were used in the first three experiments, and Jersey roots in the last experiment. Botran effectively reduced soft rot and was not toxic to the roots.

### SOPP treatments

SOPP-treated roots were dipped for 15 seconds; then half of the roots were rinsed with fresh water for 10 seconds. Acidity was 10.8 for the .5% solution; and 10.5 for the 1% solution in each experiment. Velvet roots were used in the first three experiments, and Jersey roots in the last experiment. The total weight of all roots used in these experiments was 2,375 pounds.

Table 2 summarizes the results of four experiments using SOPP as a fungicidal dip for sweet potatoes. Rinsing the roots with water after treatment with SOPP did not lessen its ability to control soft rot. However, disturbing symptoms of toxicity appeared in several of the experiments.

### Root injury

Table 3 summarizes the observations made on sweet potatoes injured by SOPP treatment, as compared with untreated

roots. Data were obtained by coding the treatments and examining the roots for pitting and shriveling. The sweet potato roots in column A showed no visible damage, while those in column B showed slight damage which would not have affected their marketability. The roots in column C were sufficiently injured to have their marketability lowered, and column D roots would have been unmarketable. Injury was more severe in some lots than others. If rough handling preceded treatment, the roots were damaged more by SOPP than roots not skinned or bruised.

### Northern California tests

The sweet potatoes used in the test in Merced County were "medium" size Jerseys. They were harvested during the latter part of October 1964, and placed in a storage building.

Potatoes were brought out of storage on December 15 and taken to the packing shed, dumped into a water tank, and then elevated out of the tank by a conveyor chain. The water tank was only half full when the potatoes from the Botran run were dumped, but was full for the Decosol and check runs. The roots were then washed by a series of clean water sprays. The fungicides were applied through two fan nozzles as the potatoes came out of the

# IN SWEET POTATOES



Sweet potato roots protected by fungicide treatment, to right, as compared with roots, to left, badly broken down from attack of soft rot.

water spray, and just prior to entering into the drying chamber. The potatoes were dried at 115° F. The drying chamber was 26 ft long, and the conveyor chain traveled at 4 ft per minute. Botran was applied at the rate of 1.5 lbs of 50% wetttable powder per 100 gals of water, and Deccosol was applied at a 0.5% dilution. Fungicides were sprayed to wet the roots; nontreated roots served as controls.

The roots were packed in fiberboard cartons, each containing approximately 42 lbs of potatoes. All packing was done off the conveyor chain as it normally would be done for the commercial market. The boxes were placed in a storage room, with temperatures ranging from

60° to 65° F., and after 21 days each potato was checked for rot. The total number of roots used in this experiment was 3,847 (see table 4).

The total number of roots checked in the above experiment included 1293 for the check, 1343 for the Botran and 1211 for the Deccosol treatment. The sweet potatoes affected with soft rot in the check boxes were usually found in clusters. The major part of the check potatoes were unfit for market due to the severe stains on the roots from the residue of rotten potatoes and from the larvae and adults of *Drosophila* (vinegar or fruit fly). No phytotoxicity was noted on any of the treated roots in these northern tests.

TABLE 1. PERCENTAGE OF ROTTED SWEET POTATO ROOTS TWO WEEKS AFTER TREATMENT WITH BOTRAN

	Experiment No.			
	I	II	III	IV
Check	100	28.5	10.5	5.0
Botran	1.7	1.7	1.0	0.5

TABLE 2. PERCENTAGE OF ROTTED SWEET POTATO ROOTS TWO WEEKS AFTER TREATMENT

	Experiment No.			
	I	II	III	IV
Check	100	50.3	9.0	11.2
SOPP 1/2%		10.1	0	1.9
SOPP 1/2% rinsed	5	3.8	2.9	3.7
SOPP 1%		3.0	1.8	0
SOPP 1% rinsed		2.9	0	2.2

TABLE 3. PERCENTAGE OF INJURY TO SWEET POTATO ROOTS

	Experiment No.			
	A	B	C	D
Check	99	.5	.5	0
SOPP 1/2%	55	14.0	20.0	11.0
SOPP 1/2% rinsed	44	25.0	20.0	11.0
SOPP 1%	55	15.0	21.0	9.0
SOPP 1% rinsed	43	20.0	28.0	9.0

TABLE 4. CONDITION OF SWEET POTATOES 21 DAYS AFTER TREATMENT

	Experiment No.			
	Number rotted	Number good	Percent soft rot	Percent good
Check	353	126.3	22.3	31.7
Botran	3.8	164.1	2.2	39.0
Deccosol	0.75	150.2	0.5	39.0

These experiments indicate that Botran and SOPP are effective for the control of soft rot of sweet potatoes; however, this article is a report of progress in research and is not to be considered a recommendation of the University of California at this time.

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