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# Spoilage of Fresh Fruits and Vegetables in Rail Shipments Unloaded at New York City 1935-42

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UNITED STATES DEPARTMENT OF AGRICULTURE

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## Spoilage<sup>1</sup> of Fresh Fruits and Vegetables in Rail Shipments Unloaded at New York City, 1935-42

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<sup>1</sup> Spoilage as used in this circular does not include losses due to freezing, bruising, overripeness, and similar factors. Practically all of the spoilage herein referred to consisted of damage from decay; in a few specified instances certain bacterial and fungus diseases and certain nonparasitic diseases and injuries are included with decay.

**D**ECAY AND OTHER SPOILAGE of such perishable commodities as fresh fruits and vegetables between the times of harvest or of preparation for market and of arrival at the terminal market have been even less adequately summarized than have the crop losses caused by pathogens in fields and orchards. A good source of information on the amount of decay in shipments upon arrival at terminal markets is the inspection certificates issued by the Fruit and Vegetable Branch, Production and Marketing Administration, United States Department of Agriculture.<sup>2</sup> Certain of these inspection certificates have been summarized for apples,<sup>3</sup> stone fruits,<sup>4</sup> strawberries,<sup>5</sup> and tomatoes.<sup>7</sup>

These summaries, although limited to a few commodities, are an important contribution to the knowledge on market losses. As pointed out by several of the writers, however, there is a natural tendency for inspections to be requested on carlots that show evidence of decay rather than on those that seem to be in good condition.

In 1931 a group of produce dealers in New York City formed an organization known as the Western Perishable Carload Receivers' Association of New York, Inc. An agreement between it and the United States Department of Agriculture whereby all carlots of produce received by the members were inspected on arrival by the Federal inspectors was in effect from 1931 until midsummer of 1942. During that period membership in the Association averaged about 15, but it varied through the years because a few dealers dropped out and others joined. The resulting certificates, therefore, covered a wide variety of fruits and vegetables. For most of the commodities they represent an unselected cross section or true random sample of all rail shipments of these commodities unloaded at New York City. There are some exceptions, however, because the carlots inspected of some commodities originated chiefly from certain States rather than from all States making rail shipments to the New York City market.

## MATERIAL AND METHODS

### BASIC MATERIAL

Only the inspections carried out under the agreement mentioned above were analyzed. The period covered was from July 1, 1935, to August 1, 1942 (hereafter referred to as the 7-year period). For certain commodities not inspected every year, the period covered was less than 7 years.

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<sup>2</sup> Formerly Fresh Fruit and Vegetable Inspection Service, Bureau of Agricultural Economics.

<sup>3</sup> ROSE, D. H. DISEASES OF APPLES ON THE MARKET. U. S. Dept. Agr. Dept. Bul. 1253, 24 pp., illus. 1924.

<sup>4</sup> BROOKS, C. SPOILAGE OF STONE FRUITS ON THE MARKET. U. S. Dept. Agr. Cir. 253, 12 pp., illus. 1933.

<sup>5</sup> ROSE, D. H. DISEASES OF STRAWBERRIES ON THE MARKET. U. S. Dept. Agr. Dept. Cir. 402, 8 pp., illus. 1926.

<sup>6</sup> STEVENS, N. E. MARKET DISEASES OF STRAWBERRIES FROM THE SOUTHEASTERN STATES, 1926 TO 1930. U. S. Dept. Agr. Cir. 219, 4 pp. 1932.

<sup>7</sup> STEVENS, N. E., and NANCE, N. W. SPOILAGE OF TOMATOES IN TRANSIT, AS SHOWN BY INSPECTION CERTIFICATES, 1922 TO 1930. U. S. Dept. Agr. Cir. 245, 4 pp. 1932.

The inspectors were well trained, and all had previous experience in inspecting fruits and vegetables at various shipping points. The writers served as consultants to the inspectors, assisted in training them to recognize the diseases more commonly found, and from time to time identified specimens of the more unusual decays. The data, although not collected by trained pathologists, are considered dependable as to percentages of spoilage involved and the identification of the common decays.

All inspections were on rail shipments and almost wholly on entire carlots. They were made while the cars were being unloaded or within a few hours thereafter. In accordance with the usage of the Market News Division,<sup>8</sup> Fruit and Vegetable Branch, Production and Marketing Administration, the term "unloads" designates carlots that were actually unloaded in contrast with those that were received but that might later have been either unloaded or diverted to other markets. For convenience in comparing truck and boat shipments with rail shipments the term "carlot" is used throughout the circular. However, for truck and boat shipments the term actually refers to carlot equivalents, that is, to the number of packages of a given commodity equal to that which ordinarily constitutes a rail carlot of it.

Statements regarding the number of carlots unloaded and their distribution by method of shipment to the market are based on information contained in the mimeographed summaries of unloads at New York City that are issued annually by the Market News Division.

#### ABSTRACTING OF CERTIFICATES

Carbon copies of the inspection certificates were on file at New York City. A group of 12 Works Projects Administration workers employed for 12 weeks sorted these and abstracted from them the information needed in the study.

The certificates issued during a given year were first sorted by commodities. Those for each commodity were then separated by month of issue and those for each month were summarized on a single sheet. The data were finally assembled in commodity tables covering the entire period.

Only data relating to the type of decay or other kinds of spoilage and the average percentage of the commodity therewith affected were taken from the certificates. When only one decay percentage was given on a certificate but more than one type of decay was listed, it was assumed that the several types were of equal importance. Consequently, whenever possible the decay percentage was divided equally between them provided only whole numbers were used. When equal division was impossible, greater weight was given to the decay mentioned first. Thus, for example, if a carlot of Honey Dew melons was reported to have 5 percent decay designated as cladospo-  
rium rot and fusarium rot, the decay is allocated herein as 3 percent of the former and 2 percent of the latter. Or again, if a carload of grapes was reported to have 7 percent decay—gray mold

<sup>8</sup> Formerly the Market News Service.

rot, rhizopus rot, and blue mold rot—the decay is allocated as 3 percent of gray mold rot and 2 percent of each of the others.

If a certificate read "less than 1 percent decay", the carlot was listed on the summary sheets under "trace of decay"; later, in summarizing the data, an arbitrary value of 0.25 percent of decay was assigned to each so listed. No attempt was made during the course of the abstracting to separate decays in early and advanced stages. However, the entire question of extent of commercial loss resulting from the decays summarized herein is discussed on pages 59 to 61.

### PRESENTATION OF DATA

The writers were faced with the problem of presenting an enormous amount of factual information in enough detail to bring out the more important relations, but sufficiently condensed so that the reader would not be lost in a welter of detail. The method adopted was that of presenting a single table for each commodity and accompanying it with a formalized text description in which the order and manner of factual presentation were essentially the same for each commodity. Thus, with minor exceptions the discussions are arranged in the same order.

The importance of the commodity on the New York City market and the proportions of the total unloads that were rail, boat, and truck shipments are first pointed out. For many commodities some information is given also on the State of origin or on the country of origin if they were imported. States are listed in the order of their importance based on average annual unloads for the 7-year period. Next, information is given on the carlots inspected and the amount of decay found in them. Then, information is presented on the percentages of decay in carlots showing decay, and the types of decay in these carlots and the averages per carlot are tabulated.<sup>9</sup> The tabulation shows also whether a large percentage of one kind of decay occurred in a few carlots or a small percentage in many. Finally, salient points in the table are discussed. When a commodity was inspected only a few times the table was omitted.

The decay values presented in the tables represent the average percentage per carlot inspected. This is expressed first as a total of all kinds of decay and then separately for each type of decay noted on the certificate. Scientific names of pathogens were supplied by the writers. Under the heading "Other decay" is included all decay of which the kind was not specified on the certificate; occasionally it also included minor decays that were occasionally reported in small amounts affecting a few carlots. Usually decay is given in the tables to the nearest 0.1 percent. Percentages less than 0.05 percent are listed in the tables as "Trace." For a number of commodities certain bacterial

<sup>9</sup> For each commodity the several known types of decay are listed in the order of their importance; then "other decay" (decay not designated by type on the certificates) is listed. Importance is based on total of spoilage caused by a given type of decay; although such total spoilage is not shown, it can readily be determined on inspection of data by multiplying number of carlots affected by average percent of decay per carlot. In many instances the sum of carlots affected with each type of decay may be greater than the number of carlots of the commodity actually inspected. The extent to which this occurs indicates the extent to which more than one type of decay was found in the same carlot.



and fungus diseases and certain nonparasitic diseases and injuries are included under decay for convenience of comparison and discussion. When this occurs attention is called to the fact in a footnote.

Likewise included in the tables are the number of carlots inspected, the percentage inspected of all rail unloads at New York City (expressed as the nearest whole number), and [the percentage of all carlots inspected (also expressed as the nearest whole number) that showed decay of any kind.

In all tables the data are broken down by year of inspection. For many commodities they are also broken down by State of origin. When analysis is made by States, the data presented under "Unknown" are based on certificates on which origin was not mentioned. It is a fair assumption, however, that most of them came from one of the States shown in the same table. Occasionally a further analysis is made for all States or for certain specified ones by breaking the data down on the basis of month of unloading at New York City.

## FRUIT INSPECTIONS

### APPLES

Approximately 65,000 carlots of apples were unloaded during the 7-year period. Nearly 61 percent were truck shipments from 15 States; the majority of these came from New York, New Jersey, and Pennsylvania. Nearly 39 percent were rail shipments from 21 States; about 63 percent of all domestic rail unloads, however, were from Oregon and Washington. A few carlots were imported by boat from New Zealand; nearly 300 carlots were rail shipments from Canada.

Inspections were made on 3,265 carlots, or approximately 13 percent of all rail unloads. Distribution of decay <sup>10</sup> within them was as follows:

Decay class (percent):	Carlots in indicated decay class		Decay class (percent)—	Carlots in indicated decay class	
	Number	Percent		Number	Percent
0.....	629	19.3	Continued		
Trace-4.....	1,965	60.2	20-24.....	10	0.3
5-9.....	520	15.9	25-29.....	3	.1
10-14.....	106	3.2	30-34.....	1	Trace
15-19.....	31	1.0			

Decay, averaging 3.6 percent per carlot showing decay, was found in 2,636 carlots, or 81 percent of those inspected. Distribution of decay by types was as follows:

Distribution			Distribution		
Kind of decay:	Carlots	Average	Kind of decay—Con.	Carlots	Average
	(number)	per carlot (percent)		(number)	per carlot (percent)
Blue mold rot.....	2,241	2.8	Bitter pit.....	93	4.5
Washing injury.....	177	4.9	Bull's-eye rot.....	179	2.0
Internal break-down	321	2.5	Gray mold rot.....	105	1.5
Scald.....	133	3.9	Other decay.....	145	.7

A summary of all apple inspections is presented in table 1. Decay per carlot inspected ranged from 1.3 to 4.0 percent, with an average

<sup>10</sup> Throughout the discussion of apples decay includes types of market spoilage not caused by parasites. These are washing injury, internal break-down, scald, and bitter pit.

of 2.9 percent for the entire period. About two-thirds of the decay was blue mold rot. Washing injury and internal break-down were next in importance. The latter was reported during all but the first year; the former was found in amounts greater than a trace only during 1938-40, with greatest occurrence in 1939. Scald was next in importance. Bitter pit, bull's-eye rot, and gray mold rot together caused 0.2 percent of spoilage per carlot inspected.

TABLE 1.—Summary of apple inspections, 1935-42

## ANALYSIS BY YEARS

Year, State, or month	Carlots inspected		Percentage of carlots inspected showing decay	Average decay <sup>1</sup> per carlot inspected								
	Percentage of New York City rail unloads	Total		Total of decays	Blue mold rot <sup>2</sup>	Washing injury	Internal break-down	Scald	Bitter pit	Bull's-eye rot <sup>3</sup>	Gray mold rot <sup>4</sup>	Other decay
				Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent
1935.....	1	21	38	1.3	0.8	0	0	0	0.5	0	0	0
1936.....	3	101	39	1.9	1.0	0	.2	.2	.5	0	0	Trace
1937.....	5	213	77	3.8	2.2	0	.4	.4	.8	0	Trace	Trace
1938.....	11	430	66	2.6	1.3	.6	.2	.3	Trace	.1	.1	Trace
1939.....	20	818	87	4.0	2.6	.7	.4	.1	.1	.1	Trace	Trace
1940.....	17	614	79	2.1	1.6	.1	.2	Trace	.1	.1	Trace	Trace
1941.....	24	601	84	2.1	1.7	Trace	.2	Trace	.1	Trace	.1	Trace
1942.....	28	467	96	3.1	2.0	Trace	.2	Trace	Trace	.3	.1	Trace
Total.....	13	3,265	81	2.9	1.9	.3	.3	.2	.1	.1	Trace	Trace

## ANALYSIS BY STATES

California.....	13	58	67	4.7	0.5	0	0	0	4.0	0	0.2	Trace
Maryland.....	4	7	29	.6	.6	0	0	0	0	0	0	0
New York.....	.1	6	50	.5	.5	0	0	0	0	0	0	0
Oregon.....	8	107	83	3.2	1.6	.1	.2	.4	.1	.6	.2	Trace
Washington.....	21	3,072	81	2.9	1.9	.3	.3	.15	.1	.1	Trace	Trace
Unknown.....		15	66	1.2	.8	0	.2	0	0	0	.1	.1
Total.....		3,265	81	2.9	1.9	.3	.3	.2	.1	.1	Trace	Trace

## ANALYSIS OF OREGON AND WASHINGTON DATA BY MONTHS

January.....	23	356	86	2.8	1.9	0.6	0.2	Trace	Trace	0	0.1	Trace
February.....	23	345	88	2.7	2.1	.3	.2	0.1	Trace	0	Trace	Trace
March.....	22	405	97	3.7	2.5	.3	.6	.2	Trace	Trace	Trace	Trace
April.....	20	375	95	3.5	2.4	.1	.4	.4	Trace	.1	.1	Trace
May.....	20	371	98	4.5	2.9	0	.5	.5	.1	.4	.1	Trace
June.....	25	309	96	3.8	2.5	Trace	.3	.3	.1	.5	.1	Trace
July.....	26	81	99	3.2	2.2	0	.2	.5	0	.2	.1	Trace
August.....	40	17	100	2.1	1.5	0	.2	0	.2	.2	0	0
September.....	16	71	20	.4	.3	.1	0	0	Trace	0	0	0
October.....	13	218	26	.6	.4	.1	Trace	0	.1	0	Trace	Trace
November.....	17	277	48	1.0	.7	.3	Trace	0	Trace	0	0	Trace
December.....	20	354	72	2.2	1.3	.6	.2	Trace	.1	0	Trace	Trace
Total.....	20	3,179	81	2.9	1.9	.3	.3	.2	.1	.1	Trace	Trace

<sup>1</sup> Washing injury, internal break-down, scald, and bitter pit included with decay.<sup>2</sup> Caused by *Penicillium expansum*.<sup>3</sup> Caused by several fungi, chiefly *Neofabraea perennans* and *N. malicorticis*.<sup>4</sup> Caused by *Botrytis* spp.

In the analysis by States it will be noted that except for six carlots from New York and seven from Maryland all of known origin were western apples, that is, grown in Washington, Oregon, or California. Eastern and western fruit, therefore, cannot be compared, because the sample of eastern fruit is too small. Most of the inspections were made on Washington apples, for which the decay averaged 2.9 percent. Greatest spoilage (4.7 percent) occurred in California shipments and least (0.5 percent) in the six carlots from New York. Washing injury, internal break-down, scald, and bull's-eye rot were found only in Oregon and Washington fruit. Bitter pit was most prevalent in apples from California.

In the analysis of Oregon and Washington data by months it is seen that spoilage was greatest in May and least in September. Blue mold rot followed the same pattern. Washing injury, except for a trace in June, did not occur from May through August. Internal break-down was found in greatest amount from March through May; the greatest amount of scald was found from April through July. Bull's-eye rot occurred from March through August, with greatest amount in June.

### APRICOTS

Practically all apricot unloads were rail shipments; 91 percent came from California and most of the others from Washington. All but a few arrived during June and July.

Inspections were made on 182 carlots, or approximately 13 percent of all rail unloads during the period. The distribution of decay within them was as follows:

Decay class (percent):	Carlots in indicated decay class		Decay class (percent)—Continued	Carlots in indicated decay class	
	Number	Percent		Number	Percent
0-----	108	59.3	10-14-----	1	0.6
Trace-4-----	67	36.8	15-19-----	1	.6
5-9-----	5	2.7			

Decay, averaging 2.0 percent per carlot showing decay, was found in 74 carlots, or 41 percent of those inspected. Distribution of decay by types was as follows:

Kind of decay:	Distribution		Kind of decay—Con.	Distribution	
	Carlots (number)	Average per carlot (percent)		Carlots (number)	Average per carlot (percent)
Brown rot-----	33	1.8	Gray mold rot-----	19	1.7
Rhizopus rot-----	42	1.4	Other decay-----	4	Trace

A summary of all apricot inspections is given in table 2. Decay per carlot inspected ranged from 0 to 3.7 percent, with an average of 0.8 percent for the entire period. Rhizopus rot was reported in all but 1 year and brown rot in all but 3. Gray mold rot was reported during only 3 years. Three times as much decay was found in apricots from California as in those from Washington. Brown rot was not recorded from Washington.

TABLE 2.—Summary of apricot inspections, 1935-42

## ANALYSIS BY YEARS

Year or State	Carlots inspected		Percentage of carlots inspected showing decay	Average decay per carlot inspected				
	Percentage of New York City rail unloads	Total		Total of decays	Brown Rot <sup>1</sup>	Rhizopus rot <sup>2</sup>	Gray mold rot <sup>3</sup>	Other decay
	Percent	Number	Percent	Percent	Percent	Percent	Percent	Percent
1935.....	8	8	13	0.1	0	0.1	0	0
1936.....	13	17	29	.3	.2	.1	0	0
1937.....	13	25	0	0	0	0	0	0
1938.....	9	13	77	3.7	2.1	1.6	0	0
1939.....	20	48	15	.1	0	.1	Trace	0
1940.....	15	32	66	.9	Trace	.2	.7	0
1941.....	9	20	95	2.0	1.2	.8	0	Trace
1942.....	11	19	58	.9	.2	.2	.5	Trace
Total.....	13	182	41	.8	.3	.3	.2	Trace

## ANALYSIS BY STATES

	Percent	Number	Percent	Percent	Percent	Percent	Percent	Percent
California.....	12	157	41	0.9	0.4	0.3	0.2	Trace
Washington.....	17	22	36	.3	0	.1	.2	0
Unknown.....		3	33	.3	0	.3	Trace	0
Total.....		182	41	.8	.3	.3	.2	Trace

<sup>1</sup> Caused by *Monilinia* spp.<sup>2</sup> Caused by *Rhizopus* spp.<sup>3</sup> Caused by *Botrytis* spp.

## CHERRIES

Approximately 4,600 carlots of cherries were unloaded during 1936-42, the years during which inspections were made. Eighty-seven percent were rail shipments, chiefly from California, Washington, Oregon, and Idaho; most of them arrived during May, June, and July. Approximately 13 percent were truck shipments, nearly all of which arrived during June through August from New York State. Fourteen carlots came in by boat from Chile and 17 by rail from Canada.

Inspections were made on 801 rail carlots, or approximately 20 percent of all rail unloads. Distribution of decay within them was as follows:

Decay class (percent):	Carlots in indicated decay class		Decay class (percent)—	Carlots in indicated decay class	
	Number	Percent		Number	Percent
0.....	119	14.9	Continued		
Trace-4.....	577	72.0	25-29.....	1	0.1
5-9.....	82	10.2	30-34.....	0	0
10-14.....	13	1.6	35-39.....	0	0
15-19.....	5	.6	40-44.....	0	0
20-24.....	3	.4	45-49.....	1	.1

Decay, averaging 2.8 percent per carlot showing decay, was found in 682 carlots, or 85 percent of those inspected. Distribution of decay by types was as follows:

Kind of decay:	Distribution		Kind of decay—Con.	Distribution	
	Carlots (number)	Average per carlot (percent)		Carlots (number)	Average per carlot (percent)
Rhizopus rot.....	294	1.9	Gray mold rot.....	225	1.5
Green mold rot.....	342	1.5	Blue mold rot.....	85	1.5
Brown rot.....	203	1.7	Other decay.....	44	.8

A summary of all cherry inspections is presented in table 3. All carlots inspected were western sweet cherries, and approximately 75 percent were from Washington. Decay per carlot inspected ranged from 1.1 to 6.2 percent, with an average of 2.4 percent for the entire period. Somewhat more spoilage was due to rhizopus rot than to any other type of decay, but nearly as much was caused by green mold rot. Blue mold rot accounted for the least spoilage. Decay was greatest in cherries from Oregon and least in those from Idaho.

TABLE 3.—Summary of cherry inspections, 1936-42

## ANALYSIS BY YEARS

Year or State	Carlots inspected		Percentage of carlots inspected showing decay	Average decay per carlot inspected						
	Percentage of New York City rail unloads	Total		Total of decays	Rhizopus rot <sup>1</sup>	Green mold rot <sup>2</sup>	Brown rot <sup>3</sup>	Gray mold rot <sup>4</sup>	Blue mold rot <sup>5</sup>	Other decay
				Percent	Percent	Percent	Percent	Percent	Percent	Percent
1936.....	9	48	100	6.2	1.6	0.9	2.1	1.3	0.3	0
1937.....	8	28	89	3.5	1.4	.8	1.1	.1	.1	0
1938.....	18	103	85	2.7	.7	1.0	.3	.7	Trace	Trace
1939.....	21	139	58	1.1	.1	.4	.1	.1	.3	.1
1940.....	31	178	81	1.6	.4	1.0	.1	.1	Trace	Trace
1941.....	28	186	96	2.9	1.3	.5	.5	.3	.3	Trace
1942.....	19	119	100	2.0	.2	.1	.4	1.1	0	.2
Total.....	20	801	85	2.4	.7	.6	.45	.45	.2	Trace

## ANALYSIS BY STATES

California.....	2	42	81	2.2	0.3	0.2	1.2	0.3	0.1	0.1
Idaho.....	59	80	79	2.1	.6	.6	.5	.3	.1	Trace
Oregon.....	30	76	76	3.4	.9	.5	1.0	.8	.2	Trace
Washington.....	38	599	87	2.3	.7	.7	.3	.4	.2	Trace
Unknown.....		4	100	2.0	.8	.2	.5	.5	0	0
Total.....		801	85	2.4	.7	.6	.45	.45	.2	Trace

<sup>1</sup> Caused by *Rhizopus* spp.<sup>2</sup> Caused by *Alternaria* and *Cladosporium* spp.<sup>3</sup> Caused by *Monilinia* spp.<sup>4</sup> Caused by *Botrytis* spp.<sup>5</sup> Caused by *Penicillium* spp.

## FIGS

Figs were inspected in 1940 and 1941 only. During that period only 192 carlots, all from California, were unloaded. Inspection was made on 18 carlots, or 9 percent of all unloads. The distribution of decay within them was as follows:

Decay class (percent):	Carlots in indicated decay class	
	Number	Percent
Trace-4.....	11	61.1
5-9.....	6	33.3
10-14.....	1	5.6

Distribution of decay by types was as follows:

Kind of decay:	Distribution	
	Carlots (number)	Average per carlot (percent)
Gray mold rot.....	16	2.7
Rhizopus rot.....	14	2.5
Other decay.....	2	1.0

On the basis of all carlots inspected there were 2.5 percent of gray mold rot, 1.9 percent of rhizopus rot, and 0.1 percent of other decay—a total of 4.5 percent.

## GRAPEFRUIT

Approximately 43,000 carlots of domestic grapefruit were unloaded during the 7-year period. Nearly 58 percent were boat shipments, mostly from Florida but partly from Texas. Forty-two percent were rail shipments from Florida, Texas, California, and Arizona, from which there were a few scattered carlots; most of the rail unloads were from Florida. A few carlots came from Florida by truck. Nearly 3,500 carlots were imported by boat.

Inspections were made on 1,157 carlots, or approximately 6 percent of all rail unloads. Distribution of decay within them was as follows:

Decay class (percent):	Carlots in indicated decay class		Decay class (percent)—	Carlots in indicated decay class	
	Number	Percent		Number	Percent
0.....	569	49.2	Continued		
Trace-4.....	507	43.8	15-19.....	7	0.6
5-9.....	60	5.2	20-24.....	2	.2
10-14.....	12	1.0			

Decay, averaging 2.4 percent per carlot showing decay, was found in 588 carlots, or 51 percent of those inspected. Distribution of decay by types was as follows:

Kind of decay:	Distribution	
	Carlots (number)	Average per carlot (percent)
Blue mold rot.....	376	2.4
Stem-end rot.....	163	2.1
Other decay.....	91	1.5

A summary of all grapefruit inspections is presented in table 4. Most of the carlots inspected were from Florida or Texas. The total of decays ranged from 0.5 to 2.7 percent and averaged 1.2 percent for the entire period. Blue mold rot was more prevalent than stem-end rot in 5 years. Decay was most prevalent in fruit from California and least so in that from Florida. Stem-end rot was reported only from Florida and Texas. In the analysis of Florida and Texas data by months it was found that decay was least prevalent from November through February. Blue mold rot was most prevalent from March through July. Stem-end rot was most prevalent during July, September, and October.

TABLE 4.—Summary of grapefruit inspections, 1935-42

## ANALYSIS BY YEARS

Year, State, or month	Carlots inspected		Percentage of carlots inspected showing decay	Average decay per carlot inspected			
	Percentage of New York City rail unloads	Total		Total of decays	Blue mold rot <sup>1</sup>	Stem-end rot <sup>2</sup>	Other decay
	Percent	Number		Percent	Percent	Percent	Percent
1935.....	4	6	17	1.0	0.5	0.5	0
1936.....	5	67	39	1.2	.4	.7	.1
1937.....	11	280	31	.5	.4	.1	Trace
1938.....	13	276	45	1.2	.7	.4	.1
1939.....	1	36	31	.9	.3	.1	.5
1940.....	5	122	43	.7	.6	.1	Trace
1941.....	7	204	70	1.2	.5	.6	.1
1942.....	5	166	86	2.7	2.2	.1	.4
Total.....	6	1,157	51	1.2	.8	.3	.1

## ANALYSIS BY STATES

California.....	6	52	88	5.4	3.9	0	1.5
Florida.....	3	529	36	.8	.4	.4	Trace
Texas.....	32	564	61	1.2	.8	.3	.1
Unknown.....		12	33	.8	.7	.1	0
Total.....		1,157	51	1.2	.8	.3	.1

## ANALYSIS OF FLORIDA AND TEXAS DATA BY MONTHS

January.....	8	169	44	0.7	0.5	0.1	0.1
February.....	7	131	51	.9	.9	Trace	Trace
March.....	6	155	66	1.7	1.6	Trace	.1
April.....	4	85	81	1.9	1.7	.1	.1
May.....	2	25	88	1.6	1.3	.3	Trace
June.....	1	5	40	1.6	1.6	0	0
July.....	3	4	100	4.3	2.8	1.5	0
September.....	13	54	41	1.3	.1	1.2	0
October.....	6	124	45	1.3	.1	1.1	.1
November.....	8	170	36	.5	.1	.4	Trace
December.....	9	171	35	.4	.1	.3	Trace
Total.....	6	1,093	49	1.0	.7	.3	Trace

<sup>1</sup> Caused by *Penicillium* spp.<sup>2</sup> Caused by *Phomopsis citri* and *Diplodia natalensis*.

## GRAPES

Nearly 55,000 carlots of grapes were unloaded during the 7-year period. Approximately 91 percent were rail shipments, chiefly from California. Nearly 3 percent were truck shipments from New York and other nearby States. A few were boat shipments from California. The other 6 percent were boat shipments, most of which came from Argentina.

Inspections were made on 3,271 carlots from California, or approxi-

mately 7 percent of all rail unloads. Distribution of decay within them was as follows:

Decay class (percent):	Carlots in indicated decay class		Decay class (percent)—Continued	Carlots in indicated decay class	
	Number	Percent		Number	Percent
0-----	1,017	31.1	40-44-----	15	0.5
Trace-4-----	1,672	51.1	45-49-----	7	.2
5-9-----	294	9.0	50-54-----	7	.2
10-14-----	102	3.1	55-59-----	0	0
15-19-----	53	1.6	60-64-----	7	.2
20-24-----	25	.8	65-69-----	5	.2
25-29-----	27	.8	70-74-----	1	Trace
30-34-----	18	.6			
35-39-----	21	.6			

Decay, averaging 5.0 percent per carlot showing decay, was found in 2,254 carlots, or 69 percent of those inspected. Distribution of decay by types was as follows:

Kind of decay:	Distribution		Kind of decay—Con.	Distribution	
	Carlots (number)	Average per carlot (percent)		Carlots (number)	Average per carlot (percent)
Gray mold rot-----	1,549	4.8	Blue mold rot-----	306	3.6
Rhizopus rot-----	1,004	2.4	Other decay-----	365	.7

A summary of all grape inspections is presented in table 5. Decay per carlot inspected ranged from 1.1 to 10.9 percent and averaged 3.4 percent for the entire period. About two-thirds of all spoilage was caused by gray mold rot. The loss from rhizopus rot was more than twice as great as from the blue mold rot. Least decay occurred from March through September.

TABLE 5.—Summary of grape inspections, 1935-42<sup>1</sup>  
ANALYSIS BY YEARS

Year or month	Carlots inspected			Average decay per carlot inspected				
	Percent- age of New York City rail un- loads	Total	Percent- age of carlots inspec- ted show- ing decay	Total of decays	Gray mold rot <sup>2</sup>	Rhizo- pus rot <sup>3</sup>	Blue mold rot <sup>4</sup>	Other decay
				Percent	Percent	Percent	Percent	Percent
1935-----	10	839	88	4.7	2.7	1.4	0.5	0.1
1936-----	7	441	58	2.2	1.0	.9	.3	Trace
1937-----	6	438	36	1.3	.4	.9	Trace	Trace
1938-----	3	209	55	2.0	1.0	.5	.4	.1
1939-----	5	371	80	10.9	9.8	.6	.5	Trace
1940-----	6	438	52	1.1	.8	Trace	.2	.1
1941-----	8	512	89	1.3	.6	.2	.3	.2
1942-----	9	23	65	2.0	1.0	Trace	.9	.1
Total-----	7	3,271	69	3.4	2.3	.7	.3	.1

  

ANALYSIS BY MONTHS								
Year or month	Percent- age of New York City rail un- loads	Total	Percent- age of carlots inspec- ted show- ing decay	Total of decays	Gray mold rot <sup>2</sup>	Rhizo- pus rot <sup>3</sup>	Blue mold rot <sup>4</sup>	Other decay
January-----	8	41	76	2.1	1.6	0.2	0.2	0.1
February-----	6	7	100	6.0	2.6	.1	2.9	.4
March-----	5	1	100	1.0	0	1.0	0	0
July-----	5	57	23	.2	.1	.1	0	Trace
August-----	7	251	32	.6	.3	.3	Trace	Trace
September-----	9	609	48	1.4	.8	.4	.2	Trace
October-----	8	1,464	78	4.3	3.1	.7	.4	.1
November-----	5	721	83	4.2	2.6	1.2	.4	Trace
December-----	4	120	85	5.5	2.8	1.4	.9	.4
Total-----	7	3,271	69	3.4	2.3	.7	.3	.1

<sup>1</sup> All from California. <sup>2</sup> Caused by *Botrytis* spp. <sup>3</sup> Caused by *Rhizopus* spp. <sup>4</sup> Caused by *Penicillium* spp.



## NECTARINES

Over 1,000 carlots of nectarines were unloaded during the 7-year period. Approximately 74 percent were rail shipments from California, which arrived from June through September. The other 26 percent were winter boat shipments from Chile.

Inspections were made on 78 California carlots, or approximately 10 percent of all rail unloads. Distribution of decay within them was as follows:

Decay class (percent):	Carlots in indicated decay class		Decay class (percent)—Continued	Carlots in indicated decay class	
	Number	Percent		Number	Percent
0-----	46	59.0	10-14-----	0	0
Trace-4-----	30	38.5	15-19-----	1	1.3
5-9-----	1	1.3			

Decay, averaging 1.5 percent per carlot showing decay, was found in 32 carlots, or 41 percent of those inspected. Distribution of decay by types was as follows:

Kind of decay:	Distribution		Kind of decay—Con.	Distribution	
	Carlots (number)	Average per carlot (percent)		Carlots (number)	Average per carlot (percent)
Rhizopus rot-----	12	1.9	Brown rot-----	8	1.4
Gray mold rot-----	11	1.1	Other decay-----	6	.3

A summary of all nectarine inspections is given in table 6. Small amounts of both rhizopus rot and brown rot were rather consistently prevalent; an unusually high amount of the former was found in 1942. The total of all decays averaged 0.6 percent per carlot inspected.

TABLE 6.—Summary of nectarine inspections, 1935-42<sup>1</sup>

Year	Carlots inspected		Percentage of carlots inspected showing decay	Average decay per carlot inspected				
	Percentage of New York City rail unloads	Total		Total of decays	Rhizopus rot <sup>2</sup>	Gray mold rot <sup>3</sup>	Brown rot <sup>4</sup>	Other decay
1935-----	8	8	13	0.4	0.1	0	0.3	0
1936-----	11	8	38	.6	.3	0	.2	.1
1937-----	6	8	50	.6	.2	0	.4	0
1938-----	11	9	11	.2	0	0	.2	0
1939-----	8	9	0	0	0	0	0	0
1940-----	23	18	56	.7	.1	.6	0	0
1941-----	5	6	83	.5	.2	Trace	.2	.1
1942-----	20	12	67	1.4	1.3	0	.1	Trace
Total-----	10	78	41	.6	.3	.15	.15	Trace

<sup>1</sup> All from California.<sup>2</sup> Caused by *Rhizopus* spp.<sup>3</sup> Caused by *Botrytis* spp.<sup>4</sup> Caused by *Monilinia* spp.

## ORANGES

Over 137,000 carlots of oranges were unloaded during the 7-year period. Sixty-one percent were rail shipments, of which nearly two-thirds came from California, approximately one-third from Florida, and a few from Arizona and Texas. Boat shipments, chiefly from

Florida but including many from California and a few from Texas, made up most of the remaining 39 percent. A few scattered carlots came by truck from Florida and by boat from abroad.

Inspections were made on 1,034 carlots, or approximately 1 percent of all rail unloads. Distribution of decay within them was as follows:

Decay class (percent):	Carlots in indicated decay class	
	Number	Percent
0-----	524	50.7
Trace-4-----	466	45.1
5-9-----	36	3.5
10-14-----	8	.8

Decay, averaging 2.2 percent per carlot showing decay, was found in 510 carlots, or 49 percent of those inspected. Distribution of decay by types was as follows:

Kind of decay:	Distribution	
	Carlots (number)	Average per carlot (percent)
Blue mold rot-----	321	2.1
Stem-end rot-----	211	1.6
Other decay-----	62	1.8

TABLE 7.—Summary of orange inspections, 1935-42

ANALYSIS BY YEARS

Year, State, or month	Carlots inspected		Percent- age of carlots in- spected showing decay	Average decay per carlot inspected			
	Percent- age of New York City rail unloads	Total		Total of decays	Blue mold rot <sup>1</sup>	Stem-end rot <sup>2</sup>	Other decay
				Percent	Percent	Percent	Percent
1935-----	0.4	21	71	1.8	1.6	0	0.2
1936-----	2	225	52	1.1	.8	.3	Trace
1937-----	5	374	45	1.1	.6	.4	.1
1938-----	3	329	43	1.1	.6	.2	.3
1940-----	.1	15	27	.9	.8	.1	0
1941-----	.1	18	94	1.1	.5	.5	.1
1942-----	.4	52	88	1.1	.7	.3	.1
Total-----	1	1,034	49	1.1	.7	.3	.1

ANALYSIS BY STATES

	Percent- age of New York City rail unloads	Total	Percent- age of carlots in- spected showing decay	Total of decays	Blue mold rot <sup>1</sup>	Stem-end rot <sup>2</sup>	Other decay
California-----	0.1	62	61	1.5	1.4	0	0.1
Florida-----	3	970	48	1.0	.6	.3	.1
Unknown-----		2	50	4.1	4.0	.1	0
Total-----		1,034	49	1.1	.7	.3	.1

ANALYSIS OF FLORIDA DATA BY MONTHS

	Percent- age of New York City rail unloads	Total	Percent- age of carlots in- spected showing decay	Total of decays	Blue mold rot <sup>1</sup>	Stem-end rot <sup>2</sup>	Other decay
January-----	3	113	61	1.3	1.1	0.2	Trace
February-----	3	97	62	1.5	1.2	.2	0.1
March-----	4	167	37	.8	.5	.1	.2
April-----	3	98	38	.9	.6	.1	.2
May-----	2	86	41	.8	.5	.2	.1
June-----	2	49	73	1.8	.9	.9	0
July-----	1	9	89	1.4	.9	.5	0
September-----	100	2	0	0	0	0	0
October-----	9	90	48	1.1	.2	.8	.1
November-----	4	140	46	.8	.1	.6	.1
December-----	4	119	47	1.0	.6	.4	Trace
Total-----	3	970	48	1.0	.6	.3	.1

<sup>1</sup> Caused by *Penicillium* spp.

<sup>2</sup> Caused by *Phomopsis citri* and *Diplodia natalensis*.

From the summary of all orange inspections given in table 7, it will be noted that the average decay per carlot inspected ranged from 0.9 to 1.8 percent. The average spoilage for the entire period was 1.1 percent of all fruit; about two-thirds of this was blue mold rot. Decay was more prevalent in California fruit than in that from Florida. It should be pointed out, however, that relatively few carlots of California fruit were inspected. In the analysis of Florida data by months it will be noted that blue mold rot was responsible for twice as much spoilage as was stem-end rot. The least blue mold rot occurred from September through November. For other months it was reported rather uniformly, in amounts ranging from 0.5 to 1.2 percent. Stem-end rot was most prevalent in June and July and in October and November.

## PEACHES

Over 40,000 carlots of peaches were unloaded during the 7-year period. Rail shipments from 24 States comprised 50 percent of the unloads; however, practically all rail shipments originated in the States listed in table 8. Nearly 50 percent of all unloads were truck shipments from 14 States. A few carlots arrived by boat from Chile.

Inspections were made on 2,258 carlots, or approximately 11 percent of all rail unloads. Distribution of decay within them was as follows:

<i>Carlots in indicated decay class</i>			<i>Carlots in indicated decay class</i>		
Decay class (percent):	<i>Number</i>	<i>Percent</i>	Decay class (percent)—	<i>Number</i>	<i>Percent</i>
0-----	1, 128	50. 0	Continued		
Trace-4-----	878	38. 9	35-39-----	4	0. 2
5-9-----	147	6. 5	40-44-----	1	Trace
10-14-----	46	2. 0	45-49-----	1	Trace
15-19-----	21	. 9	50-54-----	2	. 1
20-24-----	9	. 4	55-59-----	0	0
25-29-----	7	. 3	60-64-----	0	0
30-34-----	13	. 6	65-69-----	1	Trace

Decay, averaging 3.8 percent per carlot showing decay, was found in 1,130 carlots, or 50 percent of those inspected. Distribution of decay by types was as follows:

Kind of decay:	<i>Distribution</i>	
	<i>Carlots (number)</i>	<i>Average per carlot (percent)</i>
Brown rot-----	866	3. 4
Rhizopus rot-----	501	2. 7
Other decay-----	121	. 8

A summary of all peach inspections is given in table 8. Decay per carlot inspected ranged from 0.5 to 3.5 percent and averaged 1.9 percent for the entire period. Brown rot accounted for about two-thirds of all decay and rhizopus rot for one-third; both were present each year. Decay was most prevalent (10.0 percent) in peaches from California, some decay being reported in 88 percent of the carlots inspected from that State; most of it was due to brown rot. Except for States from which 32 or fewer carlots were inspected, decay in fruit from States other than California ranged from 1.0 to 1.9 percent.

TABLE 8.—Summary of peach inspections, 1935-42

## ANALYSIS BY YEARS

Year or State	Cars inspected		Percentage of carlots inspected showing decay	Average decay per carlot inspected			
	Percentage of New York City rail unloads	Total		Total of decays	Brown rot <sup>1</sup>	Rhizopus rot <sup>2</sup>	Other decay
	Percent	Number	Percent	Percent	Percent	Percent	Percent
1935.....	13	404	39	1.4	0.7	0.6	0.1
1936.....	12	369	27	.7	.3	.4	Trace
1937.....	14	314	56	1.9	1.5	.4	0
1938.....	9	298	50	2.8	2.3	.5	Trace
1939.....	4	94	28	.5	.3	.2	0
1940.....	11	237	42	1.3	1.1	.2	Trace
1941.....	15	296	78	3.5	2.1	1.3	.1
1942.....	15	246	78	2.8	1.7	1.0	.1
Total.....	11	2,258	50	1.9	1.3	.6	Trace

## ANALYSIS BY STATES

Arkansas.....	50	5	60	2.6	2.0	0.6	0
California.....	14	78	88	10.0	8.1	1.7	.2
Colorado.....	33	8	88	1.5	.1	1.3	.1
Georgia.....	9	1,191	52	1.9	1.2	.7	Trace
Illinois.....	29	6	50	1.3	.8	.5	0
Maryland.....	23	5	40	.4	.4	0	0
New York.....	18	32	9	.2	0	.2	0
North Carolina.....	18	434	49	1.5	1.0	.5	Trace
Ohio.....	63	5	80	1.0	.6	.2	.3
Pennsylvania.....	12	20	20	1.5	.8	.7	0
South Carolina.....	7	204	48	1.4	.9	.4	.1
Virginia.....	15	138	27	1.0	.6	.2	.3
West Virginia.....	23	14	14	.2	.1	.1	0
Unknown.....		118	53	1.7	1.0	.7	Trace
Total.....		2,258	50	1.9	1.3	.6	Trace

<sup>1</sup> Caused by *Monilinia* spp.<sup>2</sup> Caused by *Rhizopus* spp.

## PEARS

Approximately 23,000 carlots of domestic pears were unloaded during the 7-year period. About 1,400 carlots arrived by boat, chiefly from Argentina. Rail shipments accounted for 87 percent of the domestic unloads; practically all of them were from California, Washington, and Oregon. Eleven percent were truck shipments, chiefly from New York; 2 percent came by boat from California.

Inspections were made on 1,405 rail carlots, or 7 percent of all rail unloads. Distribution of decay within them was as follows:

Decay class (percent):	Carlots in indicated decay class		Decay class (percent)—	Carlots in indicated decay class	
	Number	Percent		Number	Percent
0.....	461	32.8	Continued		
Trace-4.....	702	50.0	20-24.....	12	0.9
5-9.....	167	11.9	25-29.....	2	.1
10-14.....	37	2.6	30-34.....	1	.1
15-19.....	22	1.6	35-39.....	1	.1

Decay, averaging 3.8 percent per carlot showing decay, was found in 944 carlots, or 67 percent of those inspected. Distribution of decay by types was as follows:

Kind of decay:	Distribution		Kind of decay—Con.	Distribution	
	Carlots (number)	Average per carlot (percent)		Carlots (number)	Average per carlot (percent)
Blue mold rot.....	780	2.9	Alternaria rot.....	51	1.8
Gray mold rot.....	345	2.7	Other decay.....	83	1.0
Bull's-eye rot.....	65	3.0			

A summary of all pear inspections is found in table 9. Decay per carlot inspected ranged from 0.5 to 7.0 percent, with an average of 2.5 percent. Blue mold rot and gray mold rot were reported each year and accounted for practically all of the decay. Blue mold rot caused more than twice as much spoilage as did gray mold rot. Decay was most prevalent in shipments from Oregon and least so in those from California. The least decay was found from July through September. Blue mold rot was most prevalent from December through March and gray mold rot from December through June. It will be noted that all inspections were on western pears.

TABLE 9.—Summary of pear inspections, 1935-42

## ANALYSIS BY YEARS

Year, State, or month	Carlots inspected		Percent- age of carlots in- spected showing decay	Average decay per carlot inspected					
	Percent- age of New York City rail unloads	Total		Total of decays	Blue mold rot <sup>1</sup>	Gray mold rot <sup>2</sup>	Bull's- eye rot <sup>3</sup>	Alter- naria rot <sup>4</sup>	Other decay
1935.....	3	48	19	0.5	0.4	0.1	0	0	0
1936.....	5	141	68	2.5	2.1	.2	0	0	.2
1937.....	7	177	62	2.1	1.4	.4	Trace	.1	.2
1938.....	6	192	77	2.8	1.6	.6	.3	.3	Trace
1939.....	6	179	65	1.9	1.5	.3	Trace	.1	0
1940.....	6	158	68	2.7	1.9	.7	.1	Trace	Trace
1941.....	16	395	63	1.8	1.2	.5	Trace	Trace	.1
1942.....	14	115	93	7.0	3.0	3.0	1.0	0	Trace
Total.....	7	1,405	67	2.5	1.6	.7	.1	.05	.05

## ANALYSIS BY STATES

	Percent- age of New York City rail unloads	Total	Percent	Percent	Percent	Percent	Percent	Percent	Percent
California.....	3	227	30	0.9	0.5	0.3	0	Trace	0.1
Oregon.....	5	438	80	3.5	1.8	1.1	.5	0.1	Trace
Washington.....	25	717	73	2.4	1.8	.5	Trace	Trace	.1
Unknown.....		23	43	3.2	1.9	0	0	0	1.3
Total.....		1,405	67	2.5	1.6	.7	.1	.05	.05

## ANALYSIS BY MONTHS

	Percent- age of New York City rail unloads	Total	Percent	Percent	Percent	Percent	Percent	Percent	Percent
January.....	10	131	93	4.6	2.9	1.5	0.1	Trace	0.1
February.....	9	78	94	3.7	2.6	1.0	Trace	0.1	Trace
March.....	8	73	90	4.2	2.4	1.4	.3	.1	Trace
April.....	9	83	94	5.1	1.9	1.7	1.1	.3	.1
May.....	1.1	61	98	4.9	1.6	2.0	1.1	.2	0
June.....	1.3	11	63	4.5	1.9	1.8	.6	0	.2
July.....	3	43	5	.1	.1	0	0	0	0
August.....	3	97	8	.1	.1	Trace	0	0	Trace
September.....	3	87	23	.2	.2	Trace	0	Trace	Trace
October.....	9	279	47	1.2	1.0	.2	0	Trace	Trace
November.....	11	267	73	2.1	1.8	.2	0	0	.1
December.....	10	195	93	3.4	2.3	.8	0	.2	.1
Total.....	7	1,405	67	2.5	1.6	.7	.1	.05	.05

<sup>1</sup> Caused by *Penicillium expansum*.<sup>2</sup> Caused by *Botrytis* spp.<sup>3</sup> Caused by various fungi, chiefly *Neofabraea perennans* and *N. malicorticis*.<sup>4</sup> Caused by *Alternaria* spp.

## PLUMS AND PRUNES

Over 12,000 carlots of plums and fresh prunes were unloaded during the 7-year period. Four percent were truck shipments, chiefly from New York State; 1 percent were boat shipments from Argentina and Chile. Rail shipments, practically all of which originated in California, Idaho, Oregon, and Washington, comprised 95 percent of all unloads.

Inspections were made on 1,974 carlots, or 17 percent of all rail unloads. Distribution of decay within them was as follows:

Decay class (percent):	Carlots in indicated decay class		Decay class (percent)—	Carlots in indicated decay class	
	Number	Percent		Number	Percent
0.....	740	37.5	Continued		
Trace-4.....	1,053	53.3	30-34.....	5	0.3
5-9.....	113	5.7	35-39.....	1	.1
10-14.....	30	1.5	40-44.....	2	.1
15-19.....	17	.9	45-49.....	0	0
20-24.....	7	.4	50-54.....	0	0
25-29.....	5	.3	55-59.....	1	.1

Decay, averaging 2.8 percent per carlot showing decay, was found in 1,234 carlots, or 63 percent of those inspected. Distribution of decay by types was as follows:

Kind of decay:	Distribution		Kind of decay—Con.	Distribution	
	Carlots (number)	Average per carlot (percent)		Carlots (number)	Average per carlot (percent)
Blue mold rot.....	700	2.5	Brown rot.....	33	1.3
Rhizopus rot.....	842	1.5	Other decay.....	131	1.3
Gray mold rot.....	140	1.8			

TABLE 10.—Summary of plum and prune inspections, 1935-42

## ANALYSIS BY YEARS

Year or State	Carlots inspected			Average decay per carlot inspected					
	Percent- age of New York City rail unloads	Total	Percent- age of carlots in- spected showing decay	Total	Blue mold rot <sup>1</sup>	Rhizo- pus rot <sup>2</sup>	Gray mold rot <sup>3</sup>	Brown rot <sup>4</sup>	Other decay
				Percent	Percent	Percent	Percent	Percent	Percent
1935.....	25	275	41	1.2	0.5	0.5	0.2	Trace	Trace
1936.....	21	242	60	1.5	.6	.8	Trace	0.1	Trace
1937.....	16	245	61	1.6	.9	.7	Trace	Trace	Trace
1938.....	20	319	53	3.0	1.4	.8	.4	Trace	0.4
1939.....	12	219	59	2.1	1.2	.9	Trace	Trace	Trace
1940.....	18	348	78	1.9	1.1	.7	.1	Trace	Trace
1941.....	14	249	82	1.2	.6	.4	.1	Trace	.1
1942.....	15	77	62	.4	.1	.2	Trace	0	.1
Total.....	17	1,974	63	1.8	.9	.7	.1	Trace	.1

## ANALYSIS BY STATES

California.....	7	480	43	0.5	0.1	0.2	0.1	0.1	Trace
Idaho.....	33	762	75	2.8	1.6	.8	.2	Trace	0.2
Oregon.....	35	484	61	1.3	.6	.7	Trace	Trace	Trace
Washington.....	51	224	66	2.0	.9	1.0	.1	Trace	Trace
Unknown.....		24	67	1.8	.7	.9	.2	0	0
Total.....		1,974	63	1.8	.9	.7	.1	Trace	.1

<sup>1</sup> Caused by *Penicillium* spp.<sup>3</sup> Caused by *Botrytis* spp.<sup>2</sup> Caused by *Rhizopus* spp.<sup>4</sup> Caused by *Monilinia* spp.

A summary of all plum and prune inspections is presented in table 10. Decay per carlot inspected ranged from 0.4 to 3.0 percent and averaged 1.8 percent for the entire period. Blue mold rot and rhizopus rot, which were of nearly equal importance, were reported each year. Neither gray mold rot nor brown rot was very prevalent. The most decay was reported from Idaho fruit and the least from California. More brown rot was reported from California than from any other State. All inspections were on western fruit.

### POMEGRANATES

During the 7-year period 176 carlots of pomegranates, all rail shipments from California, were unloaded. Inspections were made on 97 carlots, or 55 percent of the total. Distribution of decay within them was as follows:

Decay class (percent):	Carlots in indicated decay class		Decay class (percent)— Continued	Carlots in indicated decay class	
	Number	Percent		Number	Percent
0-----	76	78.4	15-19-----	1	1.0
Trace-4-----	17	17.5	20-24-----	1	1.0
5-9-----	1	1.0			
10-14-----	1	1.0			

Decay, averaging 3.3 percent per carlot showing decay, was found in 21 carlots, or 22 percent of those inspected. Distribution of decay by types was as follows:

Kind of decay:	Distribution	
	Carlots (number)	Average per carlot (percent)
Gray mold rot-----	10	4.4
Blue mold rot-----	8	2.0
Other decay-----	4	2.3

On the basis of all carlots inspected there was an average of 0.45 percent of gray mold rot, 0.16 percent of blue mold rot, and 0.09 percent of other decay—a total of 0.7 percent.

### STRAWBERRIES

Approximately 13,500 carlots of strawberries were unloaded during 1936-42, the years when inspections were made. Seventy-two percent of them arrived by truck from 18 States, chiefly Florida, Virginia, Maryland, North Carolina, New York, and New Jersey. Twenty-eight percent were rail shipments, nearly three-fourths of which originated in Arkansas, Florida, and Louisiana.

Inspections were made on 913 carlots, or approximately 24 percent of all rail shipments. Distribution of decay within them was as follows:

Decay class (percent):	Carlots in indicated decay class		Decay class (percent)— Continued	Carlots in indicated decay class	
	Number	Percent		Number	Percent
0-----	327	35.8	20-24-----	7	0.8
Trace-4-----	450	49.3	25-29-----	3	.3
5-9-----	81	8.9	30-34-----	2	.2
10-14-----	30	3.3			
15-19-----	13	1.4			

Decay, averaging 3.8 percent per carlot showing decay, was found in 586 carlots, or 64 percent of those inspected. Distribution of decay by types was as follows:

Kind of decay:	Distribution		Kind of Decay—Con.	Distribution	
	Carlots (number)	Average per carlot (percent)		Carlots (number)	Average per carlot (percent)
Gray mold rot.....	547	2.7	Leather rot.....	20	2.8
Rhizopus rot.....	242	2.7	Other decay.....	12	1.7

All strawberry inspections are summarized in table 11. Decay per carlot inspected ranged from 0.9 to 5.7 percent, with an average of 2.4 percent. Gray mold rot accounted for about two-thirds of the decay, and rhizopus rot for most of the rest. Leather rot was reported every year but one and from all three States. Far greater spoilage occurred in shipments from Arkansas than in those from either Louisiana or Florida. The least decay occurred in shipments from Florida.

TABLE 11.—Summary of strawberry inspections, 1936-42

ANALYSIS BY YEARS

Year or State	Carlots inspected			Average decay per carlot inspected				
	Percentage of New York City rail unloads	Total	Percentage of carlots inspected showing decay	Total of decays	Gray mold rot <sup>1</sup>	Rhizopus rot <sup>2</sup>	Leather rot <sup>3</sup>	Other decay
1936.....	32	251	85	3.0	2.3	0.6	0	0.1
1937.....	43	334	47	1.9	.9	.9	.1	Trace
1938.....	40	220	58	1.4	1.0	.3	.1	Trace
1939.....	4	3	67	1.7	1.0	0	.7	0
1940.....	4	11	9	.9	.4	0	.5	0
1941.....	4	11	46	3.4	1.8	1.2	.4	0
1942.....	20	83	99	5.7	4.3	1.2	.2	Trace
Total.....	24	913	64	2.4	1.6	.7	.1	Trace

ANALYSIS BY STATES

Arkansas.....	26	53	100	7.7	6.3	1.2	0.2	0
Florida.....	31	400	45	1.5	.9	.5	.1	Trace
Louisiana.....	17	203	70	2.1	1.0	1.0	.1	Trace
Unknown.....	.....	257	82	3.1	2.3	.8	Trace	Trace
Total.....	.....	913	64	2.4	1.6	.7	.1	Trace

<sup>1</sup> Caused by *Botrytis* spp.

<sup>2</sup> Caused by *Rhizopus nigricans*.

<sup>3</sup> Caused by *Phytophthora cactorum*.

## TANGERINES

Tangerines were inspected only during 1936-38. Approximately 4,200 carlots were unloaded, chiefly from November through April. All but 1 carlot originated in Florida. Rail shipments comprised 24 percent of all unloads; the rest came by boat.

Inspections were made on 67 carlots, or approximately 7 percent of all rail unloads. Distribution of decay within them was as follows:

Decay class (percent):	Carlots in indicated decay class		Decay class (percent)—Continued	Carlots in indicated decay class	
	Number	Percent		Number	Percent
0.....	19	28.4	10-14.....	3	4.5
Trace-4.....	37	55.2	15-19.....	0	0
5-9.....	7	10.4	20-24.....	1	1.5



Decay, averaging 3.6 percent per carlot showing decay, was found in 48 carlots, or 72 percent of those inspected. Distribution of decay by types was as follows:

Kind of decay:	Distribution	
	Carlots (number)	Average per carlot (percent)
Blue mold rot.....	27	3.8
Stem-end rot.....	21	3.3

On the basis of all carlots inspected there was an average of 1.5 percent of blue mold rot and 1.0 percent of stem-end rot—a total of 2.5 percent.

## VEGETABLE INSPECTIONS

### “ANISE” (FINOCCHIO)<sup>11</sup>

Nearly 1,600 carlots of “anise” were unloaded during the 7-year period. A little over half arrived by truck, chiefly from New Jersey and Long Island, N. Y.; fennel, however, was included in truck unloads. Rail shipments from California comprised nearly all of the other unloads. Only the latter are covered by this study.

Inspections were made on 377 California carlots, or approximately 47 percent of all rail unloads. Distribution of decay within them was as follows:

Decay class (percent):	Carlots in indicated decay class		Decay class (percent)—Continued	Carlots in indicated decay class	
	Number	Percent		Number	Percent
0.....	115	30.5	40-44.....	5	1.3
Trace-4.....	85	22.5	45-49.....	2	.5
5-9.....	63	16.7	50-54.....	3	.8
10-14.....	28	7.4	55-59.....	2	.5
15-19.....	25	6.6	60-64.....	2	.5
20-24.....	18	4.8	65-69.....	1	.3
25-29.....	15	4.0	70-74.....	0	0
30-34.....	4	1.1	75-79.....	1	.3
35-39.....	4	1.1	80-84.....	4	1.1

Decay, averaging 13.2 percent per carlot showing decay, was found in 262 carlots, or 69 percent of all inspected. Distribution of decay by types was as follows:

Kind of decay:	Distribution	
	Carlots (number)	Average per carlot (percent)
Watery soft rot.....	173	11.1
Bacterial soft rot.....	143	10.2
Other decay.....	3	24.3

A summary of all “anise” inspection data is presented in table 12. Decay per carlot inspected ranged from 3.4 to 11.9 percent and averaged 9.2 percent for the 7-year period. Over half of the decay was due to watery soft rot and most of the rest to bacterial soft rot. The most decay was found in February and the least in April; no inspections, however, were made from June through October.

<sup>11</sup> The so-called “anise” of the vegetable market consists of the rounded bunched blanched leafstalks of a horticultural form of *Foeniculum vulgare* Mill. Correctly it should be referred to as finocchio.

TABLE 12.—Summary of "anise" inspections, 1935-42<sup>1</sup>

## ANALYSIS BY YEARS

Year or month	Carlots inspected		Percent- age of carlots inspected showing decay	Average decay per carlot inspected			
	Percent- age of New York City rail unloads	Total		Total of decays	Watery soft rot <sup>2</sup>	Bacterial soft rot <sup>3</sup>	Other decay
	Percent	Number	Percent	Percent	Percent	Percent	Percent
1935.....	66	31	42	3.4	2.0	1.4	0
1936.....	53	60	60	5.2	2.2	3.0	0
1937.....	93	88	65	11.9	5.5	5.9	.5
1938.....	38	35	77	11.8	3.9	7.0	.9
1939.....	42	50	82	11.3	6.7	4.6	0
1940.....	38	48	77	10.5	7.7	2.8	0
1941.....	32	46	89	8.3	6.3	2.0	0
1942.....	31	19	53	6.5	6.5	0	0
Total.....	47	377	69	9.2	5.1	3.9	.2

## ANALYSIS BY MONTHS

Month	Percent	Number	Percent	Percent	Percent	Percent	Percent
January.....	52	65	75	9.9	4.3	5.1	0.5
February.....	54	39	95	20.1	11.9	8.2	0
March.....	45	57	84	8.3	5.3	3.0	0
April.....	34	30	57	3.1	1.3	1.8	0
May.....	17	1	100	10.0	0	10.0	0
November.....	64	21	62	11.2	6.8	4.4	0
December.....	48	164	59	7.4	4.3	2.9	.2
Total.....	47	377	69	9.2	5.1	3.9	.2

<sup>1</sup> All from California.<sup>2</sup> Caused by *Sclerotinia* spp.<sup>3</sup> Caused by *Erwinia carotovora*.

## ARTICHOKES (GLOBE)

Over 1,800 carlots of globe artichokes, all rail shipments from California, were unloaded during the 7-year period. Inspections were made on 430 carlots, or approximately 23 percent of the unloads. Distribution of decay within them was as follows:

Decay class (percent):	Carlots in indicated decay class		Decay class (percent)—	Carlots in indicated decay class	
	Number	Percent		Number	Percent
0.....	64	14.9	Continued		
Trace-4.....	165	38.4	30-34.....	6	1.4
5-9.....	105	24.4	35-39.....	3	.7
10-14.....	43	10.0	40-44.....	2	.5
15-19.....	24	5.6	45-49.....	0	0
20-24.....	13	3.0	50-54.....	1	.2
25-29.....	4	.9			

Decay, averaging 7.4 percent per carlot showing decay, was found in 366 carlots, or 85 percent of those inspected. Distribution of decay by types was as follows:

Kind of decay:	Distribution	
	Carlots (number)	Average per carlot (percent)
Gray mold rot.....	362	7.4
Other decay.....	5	9.2

A summary of globe artichoke inspections is given in table 13. Decay, chiefly gray mold rot, was the highest (9.7 percent) in 1941 and least (0.8 percent) in 1935, with an average of 6.4 percent for the

entire period. Decay tended to be most prevalent during the first 5 months of the year, but the one carlot inspected in July had 45.0 percent of gray mold rot.

TABLE 13.—Summary of globe artichoke inspections, 1935-42<sup>1</sup>

## ANALYSIS BY YEARS

Year or month	Carlots inspected		Percent- age of carlots in- spected showing decay	Average decay per carlot inspected		
	Percent- age of New York City rail unloads	Total		Total of decays	Gray mold rot <sup>2</sup>	Other decay
	Percent	Number	Percent	Percent	Percent	Percent
1935.....	15	4	25	0.8	0.8	0
1936.....	23	60	88	5.9	5.4	.5
1937.....	35	64	80	5.1	5.1	0
1938.....	18	41	93	8.2	8.2	0
1939.....	33	121	81	6.5	6.4	.1
1940.....	24	53	75	5.2	5.2	0
1941.....	29	55	96	9.7	9.7	0
1942.....	9	32	100	3.7	3.7	0
Total.....	23	430	85	6.4	6.3	.1

## ANALYSIS BY MONTHS

Month	Percent- age of New York City rail unloads	Total	Percent- age of carlots in- spected showing decay	Total of decays	Gray mold rot <sup>2</sup>	Other decay
January.....	11	13	69	8.2	8.2	0
February.....	15	28	100	13.5	13.5	0
March.....	22	110	95	6.6	6.3	.3
April.....	31	161	87	6.5	6.4	.1
May.....	32	65	82	5.1	5.1	0
June.....	6	1	100	1.0	1.0	0
July.....	100	1	100	45.0	45.0	0
September.....	43	3	100	3.3	3.3	0
October.....	27	16	56	1.6	1.6	0
November.....	16	17	71	3.3	3.1	.2
December.....	13	15	33	1.6	1.6	0
Total.....	23	430	85	6.4	6.3	.1

<sup>1</sup> All from California.<sup>2</sup> Caused by *Botrytis* spp.

## ASPARAGUS

Over 9,900 carlots of asparagus were unloaded during the 7-year period. Shipments by rail constituted 47 percent of all unloads; 53 percent were truck shipments from a number of States, of which New Jersey was by far the most important. Approximately 87 percent of the rail unloads originated in California and the rest chiefly in South Carolina.

The present study covers the inspection of 1,252 California carlots, or 31 percent of the New York City unloads from that State. Distribution of decay within them was as follows:

Decay class (percent):	Carlots in indicated decay class		Decay class (percent)— Continued	Carlots in indicated decay class	
	Number	Percent		Number	Percent
0.....	499	39.9	25-29.....	5	0.4
Trace-4.....	519	41.5	30-34.....	5	.4
5-9.....	160	12.8	35-39.....	2	.2
10-14.....	24	1.9	40-44.....	3	.2
15-19.....	18	1.4			
20-24.....	17	1.4			

Decay, averaging 4.7 percent per carlot showing decay, was found in 753 carlots, or 60 percent of those inspected. The distribution of decay by types was as follows:

Kind of decay:	Distribution		Kind of decay—Con.	Distribution	
	Carlots (number)	Average per carlot (percent)		Carlots (number)	Average per carlot (percent)
Bacterial soft rot	676	4.5	Blue mold rot	15	2.7
Phytophthora rot	81	3.7	Other decay	62	2.5

A summary of all asparagus inspections is given in table 14. Bacterial soft rot was regularly the most important decay; it was most prevalent in 1942. Phytophthora rot was not reported before 1940; it was most prevalent in 1941. Bacterial soft rot, and therefore total of decay, was most prevalent from March through May. Phytophthora rot was reported in March, April, and May (trace only). An average of 2.8 percent decay occurred during the entire period.

TABLE 14.—Summary of asparagus inspections, 1935-42<sup>1</sup>

ANALYSIS BY YEARS

Year or month	Carlots inspected		Percent- age of carlots inspected showing decay	Average decay per carlot inspected				
	Percent- age of New York City rail unloads <sup>2</sup>	Total		Total of decays	Bacterial soft rot <sup>3</sup>	Phytoph- thora rot <sup>4</sup>	Blue mold rot <sup>5</sup>	Other decay
	Percent	Number		Percent	Percent	Percent	Percent	Percent
1935	83	10	0	0	0	0	0	0
1936	35	205	46	1.5	1.1	0	.1	.3
1937	37	205	45	1.1	1.0	0	Trace	.1
1938	21	90	69	3.3	2.6	0	.1	.6
1939	39	196	50	1.8	1.7	0	Trace	.1
1940	36	288	75	3.9	3.4	.5	0	Trace
1941	21	144	57	2.5	1.6	.9	Trace	0
1942	24	114	94	7.4	7.0	.3	0	.1
Total	31	1,252	60	2.8	2.4	.3	Trace	.1

ANALYSIS BY MONTHS

	Percent- age of New York City rail unloads <sup>2</sup>	Total	Percent- age of carlots inspected showing decay	Total of decays	Bacterial soft rot <sup>3</sup>	Phytoph- thora rot <sup>4</sup>	Blue mold rot <sup>5</sup>	Other decay
February	32	13	23	0.4	0	0	0	0.4
March	30	239	44	1.3	.8	.4	0	.1
April	30	823	64	3.0	2.6	.3	Trace	.1
May	38	163	71	4.6	4.2	Trace	.1	.3
October	18	6	0	0	0	0	0	0
November	17	8	25	.1	.1	0	0	0
Total	31	1,252	60	2.8	2.4	.3	Trace	.1

<sup>1</sup> All from California.

<sup>2</sup> Based on California unloads only.

<sup>3</sup> Caused by *Erwinia carotovora*.

<sup>4</sup> Caused by *Phytophthora* spp.

<sup>5</sup> Caused by *Penicillium* spp.

## BEANS (LIMA)

Over 4,400 carlots of domestic lima beans were unloaded during the 7-year period. Eighty-eight percent of all unloads were truck shipments from many States; a large part of these originated in New Jersey and New York (including Long Island and other New York districts). The other 12 percent were rail shipments, of which 82 percent originated in California or Florida, the only States covered by the inspections.

Inspections were made on 183 carlots, or 36 percent of all rail unloads. Distribution of decay<sup>12</sup> within them was as follows:

Decay class (percent):	Carlots in indicated decay class		Decay class (percent)—	Carlots in indicated decay class	
	Number	Percent		Number	Percent
0.....	140	76.5	Continued		
Trace-4.....	33	18.0	15-19.....	0	0
5-9.....	5	2.7	20-24.....	1	.5
10-14.....	2	1.1	25-29.....	2	1.1

Decay, averaging 3.8 percent per carlot showing decay, was reported in 43 carlots, or 23 percent of those inspected. Distribution of decay by types was as follows:

Kind of decay:	Distribution		Kind of decay—Con.	Distribution	
	Carlots (number)	Average per carlot (percent)		Carlots (number)	Average per carlot (percent)
Gray mold rot.....	13	4.2	Soil rot.....	2	5.5
Bacterial soft rot.....	17	3.0	Rhizopus rot.....	2	1.0
Bacterial blight.....	1	20.0	Other decay.....	6	1.7
Watery soft rot.....	12	1.3			

A summary of the lima bean inspections is given in table 15. For all 183 carlots decay averaged 0.9 percent per carlot inspected. Gray mold rot and bacterial soft rot were of equal importance and together

TABLE 15.—Summary of lima bean inspections, 1935-42

ANALYSIS BY YEARS

Year or State	Carlots inspected		Percentage of carlots inspected showing decay	Average decay <sup>1</sup> per carlot inspected							
	Percentage of New York City rail unloads	Total		Total of decays	Gray mold rot <sup>2</sup>	Bacterial soft rot <sup>3</sup>	Bacterial blight <sup>4</sup>	Watery soft rot <sup>5</sup>	Soil rot <sup>6</sup>	Rhizopus rot <sup>7</sup>	Other decay
				Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent
1935.....	37	22	5	0.1	0.1	0	0	0	0	0	0
1936.....	46	35	14	.6	.3	.2	0	.1	0	0	0
1937.....	55	29	34	2.2	1.4	.5	0	0	.3	Trace	0
1938.....	17	27	19	.4	.1	Trace	0	Trace	0	Trace	.3
1939.....	49	32	22	.9	0	.7	0	.2	Trace	0	0
1940.....	49	20	15	.4	0	.2	0	.2	0	0	0
1941.....	65	15	73	2.0	.1	.3	1.3	.2	0	0	.1
1942.....	8	3	33	.3	0	0	0	0	0	0	.3
Total.....	36	183	23	.9	.3	.3	.1	.1	Trace	Trace	.1

ANALYSIS BY STATES

California.....	54	123	16	0.4	0.1	Trace	0.2	0.1	0	Trace	Trace
Florida.....	11	21	43	2.3	.7	1.0	0	.1	.5	0	0
Unknown.....		39	36	1.8	.8	.7	0	.1	Trace	Trace	.2
Total.....		183	23	.9	.3	.3	.1	.1	Trace	Trace	.1

<sup>1</sup> Bacterial blight included with decay.

<sup>2</sup> Caused by *Botrytis* spp.

<sup>3</sup> Caused by *Erwinia carotovora*.

<sup>4</sup> Caused by *Xanthomonas phaseoli*.

<sup>5</sup> Caused by *Sclerotinia* spp.

<sup>6</sup> Caused by *Rhizoctonia solani*.

<sup>7</sup> Caused by *Rhizopus* spp.

<sup>12</sup> Bacterial blight included with decay.

caused two-thirds of all spoilage. Decay was higher in 1937 and 1941 than in other years. Much more decay was reported in lima beans from Florida than in those from California.

### BEANS (SNAP)

Nearly 43,000 carlots of snap beans were unloaded during the 7-year period. Truck shipments from Pennsylvania, New Jersey, New York (including Long Island), and a number of South Atlantic States, including Florida, comprised 64 percent of all unloads; 4 percent were boat shipments; 32 percent were rail shipments. Eighty-seven percent of the rail unloads originated in Florida.

Inspections were made on 2,175 carlots, or 16 percent of all rail unloads. Distribution of decay<sup>13</sup> within them was as follows:

Decay class (percent):	Carlots in indicated decay class		Decay class (percent)—	Carlots in indicated decay class	
	Number	Percent		Number	Percent
0-----	1,847	84.9	Continued		
Trace-4-----	261	12.0	25-29-----	1	Trace
5-9-----	44	2.0	30-34-----	0	0
10-14-----	15	.7	35-39-----	0	0
15-19-----	5	.2	40-44-----	1	Trace
20-24-----	1	Trace			

Decay, averaging 3.1 percent per carlot showing decay, was reported from 328 carlots, or 15 percent of those inspected. It was distributed by types as follows:

Kind of decay:	Distribution		Kind of decay—Con.	Distribution	
	Carlots (number)	Average per carlot (percent)		Carlots (number)	Average per carlot (percent)
Bacterial blight-----	42	6.4	Bacterial soft rot---	38	2.5
Watery soft rot-----	122	2.0	Rhizopus rot-----	4	6.0
Soil rot-----	73	2.0	Other decay-----	73	1.5
Anthraxnose-----	39	3.4			

A summary of all snap bean inspections is presented in table 16. The majority of the carlots of which the origin was known were from Florida. Decay per carlot inspected ranged from 0.2 to 0.9 percent and for the entire period averaged 0.5 percent. This was divided evenly between bacterial blight, watery soft rot, soil rot, anthracnose, and other decay. Rhizopus rot and bacterial soft rot averaged only trace. Decay was most prevalent (4.3 percent) in beans from Mississippi in the few inspections made; watery soft rot and soil rot were responsible for the decay. Decay averaged 0.4 percent for Florida carlots and 0.5 percent for those for which States were not given; all but 107 carlots fell within these 2 groups. From the analysis of Florida data by months it will be noted that decay was most prevalent from October through December.

<sup>13</sup> Bacterial blight and anthracnose included with decay.

TABLE 16.—Summary of snap bean inspections, 1935-42

## ANALYSIS BY YEARS

Year, State, or month	Carlots inspected		Percentage of carlots inspected showing decay	Average decay <sup>1</sup> per carlot inspected							
	Percentage of New York City rail unloads	Total		Total of decays	Bacterial blight <sup>2</sup>	Watery soft rot <sup>3</sup>	Soil rot <sup>4</sup>	Anthraxnose <sup>5</sup>	Bacterial soft rot <sup>6</sup>	Rhizopus rot <sup>7</sup>	Other decay
1935.....	20	172	14	0.9	0.6	0.1	Trace	0.1	0.1	0	Trace
1936.....	15	480	11	.3	Trace	.1	0.1	.1	Trace	0	Trace
1937.....	12	292	11	.4	.1	.1	Trace	Trace	Trace	.1	0.1
1938.....	18	457	13	.4	.1	.1	Trace	Trace	Trace	0	.1
1939.....	17	236	9	.2	0	Trace	Trace	0	.1	Trace	.1
1940.....	16	230	12	.2	0	.2	Trace	0	Trace	0	Trace
1941.....	19	194	34	.9	.2	.4	.2	Trace	.1	0	Trace
1942.....	13	114	41	.9	0	Trace	Trace	.5	.1	.1	.2
Total.....	16	2,175	15	.5	.1	.1	.1	.1	Trace	Trace	.1

## ANALYSIS BY STATES

Florida.....	9	1,044	15	0.4	0.1	0.1	Trace	Trace	0.1	Trace	0.1
Louisiana.....	20	66	6	.2	0	Trace	0	0.1	0	0	.1
Mississippi.....	32	13	31	4.3	0	2.2	2.1	0	0	0	0
New York.....	13	4	0	0	0	0	0	0	0	0	0
South Carolina.....	1	6	17	.2	0	.2	0	0	0	0	0
Texas.....	58	7	0	0	0	0	0	0	0	0	0
Virginia.....	4	11	0	0	0	0	0	0	0	0	0
Unknown.....		1,024	16	.5	.2	.1	.1	.1	Trace	Trace	Trace
Total.....		2,175	15	.5	.1	.1	.1	.1	Trace	Trace	.1

## ANALYSIS OF FLORIDA DATA BY MONTHS

January.....	15	250	13	0.3	Trace	0.1	Trace	Trace	0.1	Trace	0.1
February.....	7	82	6	.1	0.1	Trace	0	0	Trace	0	Trace
March.....	9	91	11	.3	.1	.1	Trace	.1	0	0	Trace
April.....	8	147	10	.3	0	.1	Trace	.1	Trace	0	.1
May.....	6	90	4	.3	0	Trace	0	Trace	.1	0	.2
June.....	7	3	0	0	0	0	0	0	0	0	0
October.....	7	27	19	.8	0	.1	.1	.1	0	.5	0
November.....	7	149	24	.7	.2	.3	.1	.1	Trace	0	Trace
December.....	10	205	24	.5	.3	.1	0	0	.1	0	Trace
Total.....	9	1,044	15	.4	.1	.1	Trace	Trace	.1	Trace	.1

<sup>1</sup> Bacterial blight and anthracnose included with decay.<sup>2</sup> Caused by *Xanthomonas phaseoli*.<sup>3</sup> Caused by *Sclerotinia* spp.<sup>4</sup> Caused by *Rhizoctonia solani*.<sup>5</sup> Caused by *Colletotrichum lindemuthianum*.<sup>6</sup> Caused by *Erwinia carotovora*.<sup>7</sup> Caused by *Rhizopus* spp.

## BEETS

Nearly 10,500 carlots of beets were unloaded during the 7-year period. Truck shipments, most of which originated in New York (Long Island and elsewhere), New Jersey, and Pennsylvania, constituted 71 percent of all unloads. The rest (29 percent) were rail shipments, practically all of which were from Texas and Virginia.

Inspections were made on 1,689 carlots, or 55 percent of all rail unloads. Distribution of decay within them was as follows:

Decay class (percent):	Carlots in indicated decay class		Decay class (percent)—	Carlots in indicated decay class	
	Number	Percent		Number	Percent
0-----	1,533	90.8	Continued		
Trace-4-----	63	3.7	40-44-----	4	0.2
5-9-----	23	1.4	45-49-----	2	.1
10-14-----	19	1.1	50-54-----	3	.2
15-19-----	12	.7	55-59-----	5	.3
20-24-----	8	.5	60-64-----	1	.1
25-29-----	7	.4	65-69-----	0	0
30-34-----	2	.1	70-74-----	0	0
35-39-----	5	.3	75-79-----	2	.1

Decay, averaging 12.9 percent per carlot showing decay, was found in 156 carlots, or 9 percent of those inspected. Distribution of decay by types was as follows:

Kind of decay:	Distribution		Kind of decay—Con.	Distribution	
	Carlots (number)	Average per carlot (percent)		Carlots (number)	Average per carlot (percent)
Bacterial soft rot...	137	13.5	Fusarium rot-----	6	8.3
Gray mold rot-----	11	6.6	Other decay-----	6	7.8

TABLE 17.—Summary of beet inspections, 1935-42

ANALYSIS BY YEARS

Year, State, or month	Carlots inspected		Percentage of carlots inspected showing decay	Average decay per carlot inspected				
	Percentage of New York City rail unloads	Total		Total of decays	Bacterial soft rot <sup>1</sup>	Gray mold rot <sup>2</sup>	Fusarium rot <sup>3</sup>	Other decay
1935-----	72	33	0	0	0	0	0	0
1936-----	72	316	7	1.3	1.1	.1	0	.1
1937-----	67	267	10	1.1	.9	.2	Trace	Trace
1938-----	50	283	20	2.3	2.3	Trace	0	0
1939-----	52	215	6	1.0	.9	0	.1	0
1940-----	55	243	8	1.4	1.3	Trace	.1	Trace
1941-----	45	194	3	.3	.1	.1	0	.1
1942-----	43	138	10	.5	.5	0	0	0
Total-----	55	1,689	9	1.2	1.1	.1	Trace	Trace

ANALYSIS BY STATES

State	Percentage of New York City rail unloads	Total	Percentage of carlots inspected showing decay	Total of decays	Bacterial soft rot <sup>1</sup>	Gray mold rot <sup>2</sup>	Fusarium rot <sup>3</sup>	Other decay
Texas-----	64	1,603	9	1.2	1.1	0.1	Trace	Trace
Virginia-----	17	47	9	.7	.7	0	0	0
Unknown-----		39	21	1.3	.3	.1	0	.9
Total-----		1,689	9	1.2	1.1	.1	Trace	Trace

ANALYSIS OF TEXAS DATA BY MONTHS

Month	Percentage of New York City rail unloads	Total	Percentage of carlots inspected showing decay	Total of decays	Bacterial soft rot <sup>1</sup>	Gray mold rot <sup>2</sup>	Fusarium rot <sup>3</sup>	Other decay
January-----	71	241	10	0.9	0.9	0	0	0
February-----	60	201	6	.5	.4	0	.1	0
March-----	60	324	9	1.7	1.6	.1	Trace	Trace
April-----	62	429	5	.6	.6	0	0	0
May-----	61	198	21	3.4	3.2	.1	.1	0
June-----	48	16	56	7.2	3.5	2.9	.1	.7
November-----	100	33	9	1.4	1.4	0	0	0
December-----	72	161	1	.1	.1	0	0	0
Total-----	64	1,603	9	1.2	1.1	.1	Trace	Trace

<sup>1</sup> Caused by *Erwinia carotorora*.

<sup>2</sup> Caused by *Botrytis* spp.

<sup>3</sup> Caused by *Fusarium* spp.



A summary of all beet inspections is given in table 17. Decay per carlot inspected ranged from 0 to 2.3 percent and averaged 1.2 percent for the entire period. Nearly all was caused by bacterial soft rot. Nearly twice as much decay was found in beets from Texas as in those from Virginia. Decay in beets from Texas was most prevalent in May and June and least so in December.

### BROCCOLI

Over 8,000 carlots of broccoli were unloaded during the 7-year period. Sixty-six percent of all unloads were rail shipments, practically all of which were from the 5 States covered by these inspections. Thirty-four percent were truck shipments, chiefly from New York (Long Island and elsewhere), New Jersey, and Pennsylvania.

Inspections were made on 2,445 carlots, or 46 percent of all rail unloads. Distribution of decay<sup>14</sup> within them was as follows:

Decay class (percent):	Carlots in indicated decay class		Decay class (percent)— Continued	Carlots in indicated decay class	
	Number	Percent		Number	Percent
0-----	2,197	89.9	50-54-----	1	Trace
Trace-4-----	108	4.4	55-59-----	0	0
5-9-----	52	2.1	60-64-----	1	Trace
10-14-----	24	1.0	65-69-----	0	0
15-19-----	17	.7	70-74-----	1	Trace
20-24-----	15	.6	75-79-----	1	Trace
25-29-----	7	.3	80-84-----	2	.1
30-34-----	8	.3	85-89-----	1	Trace
35-39-----	2	.1	90-94-----	1	Trace
40-44-----	2	.1			
45-49-----	5	.2			

Decay, averaging 11.5 percent per carlot showing decay, was found in 248 carlots, or 10 percent of those inspected. Distribution of decay by types was as follows:

Kind of decay:	Distribution	
	Carlots (number)	Average per carlot (percent)
Bacterial soft rot-----	242	9.6
Alternaria leaf spot-----	12	39.2
Other decay-----	2	25.0

All broccoli inspections are summarized in table 18. Bacterial soft rot caused by far the greater part of the spoilage. Total of decays per carlot inspected ranged from 0.1 to 2.2 percent and averaged 1.2 percent for the entire period. Decay was most prevalent in broccoli from Florida and least prevalent in that from Arizona. Alternaria leaf spot was reported only from Florida. In the analysis of Arizona, California, and Texas data by months it can be seen that decay was most prevalent from December through March, with the peak in January.

<sup>14</sup> Alternaria leaf spot included with decay.

TABLE 18.—Summary of broccoli inspections, 1935-42

## ANALYSIS BY YEARS

Year, State, or month	Carlots inspected		Percent- age of carlots inspected showing decay	Average decay <sup>1</sup> per carlot inspected			
	Percent- age of New York City rail unloads	Total		Total of decays	Bacterial soft rot <sup>2</sup>	Alter- naria leaf spot <sup>3</sup>	Other decay
	<i>Percent</i>	<i>Number</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>
1935.....	73	116	3	0.2	0.2	0	0
1936.....	62	348	5	.6	.4	0	.2
1937.....	56	370	8	1.3	.8	.5	0
1938.....	39	309	10	1.7	.8	.9	0
1939.....	42	342	2	.1	.1	0	0
1940.....	41	356	10	1.3	1.3	0	0
1941.....	46	366	23	2.2	2.2	0	0
1942.....	39	238	18	1.5	1.5	0	0
Total.....	46	2,445	10	1.2	1.0	.2	Trace

## ANALYSIS BY STATES

Arizona.....	76	226	12	0.4	0.4	0	0
California.....	44	1,888	9	.8	.8	0	0
Florida.....	95	54	59	17.5	7.9	8.7	.9
Texas.....	40	159	9	.8	.8	0	0
Virginia.....	57	73	16	2.3	2.3	0	0
Unknown.....		45	7	.5	.5	0	0
Total.....		2,445	10	1.2	1.0	.2	Trace

ANALYSIS OF ARIZONA, CALIFORNIA, AND TEXAS DATA BY MONTHS <sup>4</sup>

January.....	51	413	17	1.9	1.9	0	0
February.....	44	356	12	1.0	1.0	0	0
March.....	40	326	13	1.0	1.0	0	0
April.....	30	155	6	.3	.3	0	0
May.....	24	71	7	.3	.3	0	0
June.....	27	13	0	0	0	0	0
July.....	33	1	0	0	0	0	0
August.....	46	45	0	0	0	0	0
September.....	56	88	2	.1	.1	0	0
October.....	63	135	0	0	0	0	0
November.....	52	264	2	.1	.1	0	0
December.....	51	378	6	.5	.5	0	0
Total.....	45	2,245	9	.8	.8	0	0

<sup>1</sup> Alternaria leaf spot included with decay.<sup>2</sup> Caused by *Erwinia carotovora*.<sup>3</sup> Caused by *Alternaria brassicae*.<sup>4</sup> 28 inspections inadvertently omitted.

## BRUSSELS SPROUTS

Nearly 2,100 carlots of brussels sprouts were unloaded during the 7-year period. Rail shipments constituted 28 percent of all unloads. The rest were truck shipments from nearby districts, chiefly Long Island, N. Y. Practically all rail unloads were California shipments.

Inspections were made on 463 carlots, or 78 percent of all rail unloads. Distribution of decay within them was as follows:

Decay class (percent):	Carlots in indicated decay class		Decay class (percent)—	Carlots in indicated decay class	
	Number	Percent		Number	Percent
0.....	272	58.7	Continued		
Trace-4.....	153	33.0	20-24.....	5	1.1
5-9.....	14	3.0	25-29.....	1	.2
10-14.....	13	2.8	30-34.....	0	0
15-19.....	4	.9	35-39.....	1	.2

Decay, averaging 3.7 percent per carlot showing decay, was found in 191 carlots, or 41 percent of those inspected.

A summary of all brussels sprouts inspections is given in table 19. It will be noted that decay was somewhat more prevalent in 1941 and 1942 than in other years and for the entire period averaged 1.5 percent per carlot inspected. All of the decay was reported as bacterial soft rot.

TABLE 19.—Summary of brussels sprouts inspections, 1935-42<sup>1</sup>

Year	Carlots inspected		Percentage of carlots inspected showing decay	Average decay <sup>2</sup> per carlot inspected
	Percentage of New York City rail unloads	Total		
	Percent	Number	Percent	Percent
1935.....	100	22	27	0.3
1936.....	97	61	54	1.5
1937.....	72	54	48	1.4
1938.....	73	74	24	1.0
1939.....	73	85	33	.7
1940.....	81	96	32	1.5
1941.....	78	61	66	3.6
1942.....	53	10	90	2.1
Total.....	78	463	41	1.5

<sup>1</sup> All from California.

<sup>2</sup> All reported as bacterial soft rot caused by *Erwinia carotovora*.

## CABBAGE

Nearly 43,500 carlots of cabbage were unloaded during the 7-year period. Truck shipments from a number of States, but chiefly New York and New Jersey, constituted 55 percent of all unloads. The other 45 percent arrived by rail. Almost all of the rail unloads originated in the States covered by these inspections.

Inspections were made on 4,597 carlots, or approximately 23 percent of all rail unloads. Distribution of decay<sup>15</sup> within them was as follows:

Decay class (percent):	Carlots in indicated decay class		Decay class (percent)—	Carlots in indicated decay class	
	Number	Percent		Number	Percent
0.....	1,737	37.8	Continued		
Trace-4.....	934	20.3	50-54.....	18	0.4
5-9.....	587	12.8	55-59.....	22	.5
10-14.....	405	8.8	60-64.....	12	.3
15-19.....	265	5.8	65-69.....	13	.3
20-24.....	205	4.5	70-74.....	13	.3
25-29.....	132	2.9	75-79.....	8	.2
30-34.....	84	1.8	80-84.....	3	.1
35-39.....	66	1.4	85-89.....	1	Trace
40-44.....	48	1.0	90-94.....	2	Trace
45-49.....	37	.8	95-99.....	5	.1

<sup>15</sup> *Alternaria* leaf spot included with decay.

Decay, averaging 13.2 percent per carlot showing decay, was found in 2,860 carlots, or 62 percent of those inspected. Distribution of decay by types was as follows:

Kind of decay:	Distribution		Kind of decay—Con.	Distribution	
	Carlots (number)	Average per carlot (percent)		Carlots (number)	Average per carlot (percent)
Alternaria leaf spot_	1,767	13.4	Watery soft rot_	10	7.6
Bacterial soft rot_	1,898	7.2	Other decay_	70	4.1

All cabbage inspections are summarized in table 20. In many cases the two most important types of decay, alternaria leaf spot and bacterial soft rot, were in early stages or of chief importance on the outer wrapper leaves. Consequently, damage from decay was not so great as might be suggested by the figures. Nevertheless, the summary reveals that 8.2 percent of all heads inspected showed some evidence of decay. Alternaria leaf spot was responsible for nearly two-thirds of the decay and bacterial soft rot for somewhat over one-third. Decay was lowest (2.9 percent) in 1935 and highest (12.6 percent) in 1942. Decay was greatest in cabbage from Florida (11.2 percent) and lowest (1.4 percent) in that from Arizona. The highest incidence of alternaria leaf spot was in Florida cabbage.

TABLE 20.—Summary of cabbage inspections, 1935-42

ANALYSIS BY YEARS

Year or State	Carlots inspected		Percentage of carlots inspected showing decay	Average decay <sup>1</sup> per carlot inspected				
	Percentage of New York City rail unloads	Total		Total of decays	Alternaria leaf spot <sup>2</sup>	Bacterial soft rot <sup>3</sup>	Watery soft rot <sup>4</sup>	Other decay
1935.....	11	60	22	2.9	0.2	2.7	0	0
1936.....	36	997	60	8.6	5.2	3.4	Trace	Trace
1937.....	32	980	71	9.9	6.5	3.2	0	.2
1938.....	22	703	62	7.2	4.8	2.4	Trace	Trace
1939.....	22	536	63	6.1	3.3	2.7	Trace	.1
1940.....	14	381	45	6.1	3.8	2.3	Trace	Trace
1941.....	18	441	56	5.2	3.6	1.6	0	Trace
1942.....	20	499	73	12.6	7.9	4.5	.1	.1
Total.....	23	4,597	62	8.2	5.1	3.0	Trace	.1

ANALYSIS BY STATES

Arizona.....	100	14	43	1.4	0	1.4	0	0
California.....	60	29	62	6.7	5.2	1.5	0	0
Florida.....	12	740	65	11.2	8.4	2.8	Trace	Trace
Georgia.....	2	30	50	9.5	4.1	5.4	0	0
Louisiana.....	13	6	67	4.2	0	4.0	0	.2
Mississippi.....	51	230	40	3.1	1.3	1.8	0	Trace
New York.....	6	254	34	4.3	2.2	2.0	0	.1
South Carolina.....	21	581	62	6.7	3.0	3.7	Trace	Trace
Tennessee.....	38	68	68	10.0	0	10.0	0	0
Texas.....	68	1,875	64	7.9	5.8	2.0	0	.1
Virginia.....	10	97	76	9.2	.8	8.3	0	.1
Unknown.....		673	72	10.2	5.6	4.5	Trace	.1
Total.....		4,597	62	8.2	5.1	3.0	Trace	.1

<sup>1</sup> Alternaria leaf spot included with decay.

<sup>2</sup> Caused by *Alternaria brassicae*

<sup>3</sup> Caused by *Erwinia carotovora*.

<sup>4</sup> Caused by *Sclerotinia* spp.

Over 40 percent of the inspections were made on Texas cabbage, which had an average decay (7.9 percent) close to that for all States combined; approximately three-fourths of the decay in Texas cabbage was due to alternaria leaf spot and most of the rest to bacterial soft rot.

### CARROTS

Nearly 31,500 carlots of carrots were unloaded during the 7-year period. Twenty-seven percent were truck shipments, chiefly from New Jersey and New York (both Long Island and elsewhere) and to a less extent from Pennsylvania. Seventy-three percent were rail shipments, practically all of which originated in the States covered by the present inspections.

Inspections were made on 12,344 carlots, or approximately 54 percent of all rail unloads. Distribution of decay within them was as follows:

Decay class (percent):	Carlots in indicated decay class		Decay class (percent)—	Carlots in indicated decay class	
	Number	Percent		Number	Percent
0.....	11,396	92.3	Continued		
Trace-4.....	313	2.5	50-54.....	39	0.3
5-9.....	86	.7	55-59.....	27	.2
10-14.....	105	.9	60-64.....	32	.3
15-19.....	60	.5	65-69.....	8	.1
20-24.....	62	.5	70-74.....	7	.1
25-29.....	47	.4	75-79.....	19	.2
30-34.....	41	.3	80-84.....	12	.1
35-39.....	25	.2	85-89.....	7	.1
40-44.....	30	.2	90-94.....	6	Trace
45-49.....	22	.2			

Decay, averaging 21.1 percent per carlot showing decay, was found in 948 carlots, or 8 percent of those inspected. Distribution of decay by types was as follows:

Kind of decay:	Distribution		Kind of decay—Con.	Distribution	
	Carlots (number)	Average per carlot (percent)		Carlots (number)	Average per carlot (percent)
Bacterial soft rot of leaves.....	517	20.9	Gray mold rot.....	105	6.4
Bacterial soft rot of roots.....	303	22.4	Rhizopus.....	54	9.2
Watery soft rot....	170	6.3	Fusarium rot.....	10	2.6
			Other decay.....	47	3.2

A summary of all carrot inspections is given in table 21. The least decay per carlot inspected (0.2 percent) was found in 1935 and the most (4.2 percent) in 1938. For the entire period decay averaged 1.6 percent per carlot inspected. Bacterial soft rot of leaves and roots was responsible for most of the loss. Watery soft rot and gray mold rot were next in importance. When only the three States from which most of the carrots originated are considered, decay was greatest in shipments from Arizona and lowest in those from Texas.

TABLE 21.—Summary of carrot inspections, 1935-42

## ANALYSIS BY YEARS

Year or State	Carlots inspected		Percentage of carlots inspected showing decay	Average decay per carlot inspected							
	Percentage of New York City rail unloads	Total		Total of decays	Bacterial soft rot of leaves <sup>1</sup>	Bacterial soft rot of roots <sup>1</sup>	Watery soft rot <sup>2</sup>	Gray mold rot <sup>3</sup>	Rhizopus rot <sup>4</sup>	Fusarium rot <sup>5</sup>	Other decay
1935.....	85	891	2	0.2	0.1	0.1	Trace	Trace	0	0	0
1936.....	76	2,605	3	.5	.4	Trace	0.1	Trace	0	0	Trace
1937.....	59	1,829	11	2.7	1.5	.9	.2	0.1	Trace	0	Trace
1938.....	58	1,869	16	4.2	2.2	1.7	.3	Trace	0	0	Trace
1939.....	50	1,651	7	1.9	.9	.9	Trace	0	.1	0	Trace
1940.....	50	1,622	4	.6	.4	.1	Trace	Trace	.1	Trace	Trace
1941.....	33	1,079	6	1.2	.7	.2	.1	.2	Trace	0	Trace
1942.....	33	798	12	.6	.1	Trace	.1	.3	.1	Trace	Trace
Total.....	54	12,344	8	1.6	.9	.5	.1	.1	Trace	Trace	Trace

## ANALYSIS BY STATES

Arizona.....	45	828	7	2.3	1.4	0.7	0.1	0	0.1	0	0
California.....	57	9,530	6	1.7	1.0	.6	.1	Trace	Trace	Trace	Trace
Colorado.....	75	18	0	0	0	0	0	0	0	0	0
Idaho.....	11	11	0	0	0	0	0	0	0	0	0
New Mexico.....	18	43	0	0	0	0	0	0	0	0	0
New York.....	11	18	11	.1	0	.1	0	0	0	0	0
Texas.....	44	912	21	1.5	.2	.1	.6	.5	.1	Trace	Trace
Unknown.....		984	10	.6	.2	Trace	.1	.2	.1	0	Trace
Total.....		12,344	8	1.6	.9	.5	.1	.1	Trace	Trace	Trace

<sup>1</sup> Caused by *Erwinia carotovora*.<sup>2</sup> Caused by *Sclerotinia* spp.<sup>3</sup> Caused by *Botrytis* spp.<sup>4</sup> Caused by *Rhizopus* spp.<sup>5</sup> Caused by *Fusarium* spp.

## CAULIFLOWER

Over 25,000 carlots of cauliflower were unloaded during the 7-year period. Truck shipments, almost entirely from New Jersey and New York (Long Island and elsewhere), constituted 68 percent of all unloads. Thirty-two percent consisted of rail shipments, practically all of which originated in the States covered by the present inspections.

Inspections were made on 4,596 shipments, or 57 percent of all rail unloads. Distribution of decay within them was as follows:

Decay class (percent):	Carlots in indicated decay class		Decay class (percent)—Continued	Carlots in indicated decay class	
	Number	Percent		Number	Percent
0.....	3,919	85.2			
Trace-4.....	486	10.6	30-34.....	6	0.1
5-9.....	109	2.4	35-39.....	3	.1
10-14.....	28	.6	40-44.....	3	.1
15-19.....	23	.5	45-49.....	0	0
20-24.....	4	.1	50-54.....	6	.1
25-29.....	9	.2			

Decay, averaging 4.8 percent per carlot showing decay, was found in 677 carlots, or 15 percent of those inspected. Distribution of decay by types was as follows:

Kind of decay:	Distribution		Kind of decay—Con.	Distribution	
	Carlots (number)	Average per carlot (percent)		Carlots (number)	Average per carlot (percent)
Bacterial soft rot of leaves.....	324	5.6	Watery soft rot of curd.....	63	3.0
Bacterial soft rot of curd.....	319	3.5	Alternaria rot of curd.....	9	5.6
			Other decay.....	28	3.5

A summary of all cauliflower inspections is presented in table 22. Decay per carlot inspected ranged from 0.4 to 1.2 percent, with an average of 0.7 percent for the entire period. Bacterial soft rot of leaves and curd accounted for most of it. When only the three States represented by more than a relatively few inspections were considered, decay was lowest (0.6 percent) in cauliflower from California and highest (2.1 percent) in that from Colorado.

TABLE 22.—Summary of cauliflower inspections, 1935–42

## ANALYSIS BY YEARS

Year, State, or month	Carlots inspected		Percentage of carlots inspected showing decay	Average decay per carlot inspected					
	Percentage of New York City rail unloads	Total		Total of decays	Bacterial soft rot of leaves <sup>1</sup>	Bacterial soft rot of curd <sup>1</sup>	Watery soft rot of curd <sup>2</sup>	Alternaria rot of curd <sup>3</sup>	Other decay
1935.....	69	177	10	0.5	0.1	0.2	Trace	0	0.2
1936.....	60	895	8	.4	.2	.2	Trace	Trace	Trace
1937.....	62	788	14	.7	.5	.1	0.1	Trace	Trace
1938.....	61	777	16	1.0	.7	.3	Trace	Trace	Trace
1939.....	54	652	19	1.2	.7	.3	.2	0	Trace
1940.....	55	592	11	.4	.2	.2	0	0	Trace
1941.....	54	444	22	.6	.1	.5	Trace	0	Trace
1942.....	39	271	29	.9	.2	.7	Trace	Trace	Trace
Total.....	57	4,596	15	.7	.4	.2	.1	Trace	Trace

## ANALYSIS BY STATES

	Percent	Number	Percent	Percent	Percent	Percent	Percent	Percent	Percent
Arizona.....	49	395	12	1.2	0.6	0.4	0.1	0	0.1
California.....	62	3,900	15	.6	.3	.2	.1	Trace	Trace
Colorado.....	47	211	23	2.1	1.4	.6	0	.1	0
Oregon.....	40	10	30	1.8	0	1.3	0	0	.5
Washington.....	38	36	6	.2	.1	.1	0	0	0
Unknown.....		44	18	1.2	1.1	.1	0	Trace	0
Total.....		4,596	14	.7	.4	.2	.1	Trace	Trace

## ANALYSIS OF CALIFORNIA DATA BY MONTHS

	Percent	Number	Percent	Percent	Percent	Percent	Percent	Percent	Percent
January.....	63	515	24	1.2	0.7	0.5	Trace	Trace	0
February.....	59	664	20	.9	.4	.4	0.1	Trace	Trace
March.....	59	898	12	.3	.1	.1	.1	Trace	Trace
April.....	61	753	15	.6	.1	.1	.1	0	Trace
May.....	65	506	6	.2	.1	.1	Trace	0	Trace
June.....	73	83	2	.1	.1	0	0	0	0
August.....	100	1	0	0	0	0	0	0	0
September.....	71	5	60	4.8	4.0	.8	0	0	0
October.....	75	3	0	0	0	0	0	0	0
November.....	64	30	3	.1	.1	0	0	0	0
December.....	67	442	12	.5	.2	.3	Trace	Trace	Trace
Total.....	62	3,900	15	.6	.3	.2	.1	Trace	Trace

<sup>1</sup> Caused by *Erwinia carotovora*.<sup>2</sup> Caused by *Sclerotinia* spp.<sup>3</sup> Caused by *Alternaria brassicae*.

## CELERY

Nearly 39,500 carlots of celery were unloaded during the 7-year period. Thirty-nine percent were truck shipments, practically all of which came from New Jersey and New York (Long Island and elsewhere). Rail shipments constituted 61 percent of the unloads; nearly all of them originated in the States listed in table 23.

Inspections were made on 4,757 carlots, or approximately 20 percent of all rail unloads. Distribution of decay<sup>16</sup> within them was as follows:

Decay class (percent):	Carlots in indicated decay class		Decay class (percent)— Continued	Carlots in indicated decay class	
	Number	Percent		Number	Percent
0-----	1,908	40.1	50-54-----	22	0.5
Trace-4-----	1,299	27.3	55-59-----	9	.2
5-9-----	580	12.2	60-64-----	20	.4
10-14-----	287	6.0	65-69-----	10	.2
15-19-----	193	4.1	70-74-----	10	.2
20-24-----	119	2.5	75-79-----	7	.1
25-29-----	83	1.7	80-84-----	8	.2
30-34-----	76	1.6	85-89-----	6	.1
35-39-----	38	.8	90-94-----	14	.3
40-44-----	34	.7	95-99-----	8	.2
45-49-----	26	.5			

Decay, averaging 11.1 percent per carlot showing decay, was found in 2,849 carlots, or 60 percent of those inspected. Distribution of decay by types was as follows:

Kind of decay:	Distribution		Kind of decay—Con.	Distribution	
	Carlots (number)	Average per carlot (percent)		Carlots (number)	Average per carlot (percent)
Watery soft rot---	1,435	7.2	Blackheart-----	303	5.5
Late blight-----	442	20.3	Early blight-----	36	14.3
Bacterial soft rot of leaves-----	1,311	6.3	Other decay-----	125	1.0
Bacterial soft rot of stalks-----	217	7.5			

A summary of all celery inspections is given in table 23. Decay per carlot inspected ranged from 1.5 to 10.1 percent and averaged 6.6 percent for the entire 7-year period. Much of the decay was found in early stages, however, and much of it affected only the leaves. Watery soft rot was the most prevalent decay; following closely thereafter were late blight and bacterial soft rot.

Least decay occurred in celery from Florida and most in that from California. Relatively, late blight was particularly important in shipments from California and early blight in those from Florida. In the analysis of California data by months it will be noted that decay was most prevalent from January through September. Late blight occurred from November through June and was most prevalent in February and March. In the Florida shipments decay was most prevalent from April through June. Bacterial soft rot of stalks was found in January and from March through June, blackheart from January through June, and early blight from February through May.

<sup>16</sup> Early blight, late blight, and the nonparasitic trouble blackheart included with decay.



TABLE 23.—Summary of celery inspections, 1935-42

## ANALYSIS BY YEARS

Year, State, or month	Carlots inspected		Per-centage of carlots inspected showing decay	Average decay <sup>1</sup> per carlot inspected							
	Per-centage of New York City rail unloads	Total		Total of decays	Wate-ry soft rot <sup>2</sup>	Late blight <sup>3</sup>	Bac-terial soft rot of leaves <sup>4</sup>	Bac-terial soft rot of stalks <sup>4</sup>	Black-heart	Early blight <sup>5</sup>	Other decay
1935.....	20	272	19	1.5	0.1	Trace	1.0	0.1	0.2	0.1	0
1936.....	17	573	54	4.2	.9	0.2	2.2	.3	.5	.1	0
1937.....	16	599	65	7.2	1.8	1.3	2.4	1.0	.6	Trace	.1
1938.....	16	573	70	10.1	3.1	4.3	1.9	.3	.3	.2	Trace
1939.....	17	536	65	6.7	3.0	1.5	1.4	.3	.5	Trace	0
1940.....	23	726	62	7.2	2.3	1.9	2.2	.3	.5	0	0
1941.....	28	811	62	7.9	2.7	2.8	1.5	.3	.2	.3	.1
1942.....	22	667	60	5.2	2.3	1.8	.9	.1	Trace	Trace	.1
Total.....	20	4,757	60	6.6	2.2	1.9	1.7	.3	.4	.1	Trace

## ANALYSIS BY STATES

California.....	41	3,206	64	7.6	2.6	2.5	1.8	0.3	0.4	Trace	Trace
Florida.....	10	1,131	50	4.2	1.4	.8	1.1	.3	.2	0.4	Trace
New York.....	4	213	58	5.4	1.3	.3	3.0	.5	.1	.1	0.1
Washington.....	59	10	60	4.8	.1	0	3.8	.9	0	0	0
Unknown.....		197	56	7.0	1.6	.4	3.4	1.5	.1	Trace	Trace
Total.....		4,757	60	6.6	2.2	1.9	1.7	.3	.4	.1	Trace

## ANALYSIS OF CALIFORNIA DATA BY MONTHS

January.....	46	784	73	9.9	3.7	3.9	1.3	0.3	0.7	Trace	Trace
February.....	46	210	79	20.6	5.9	10.4	3.6	.4	.2	0	0.1
March.....	44	82	76	23.2	4.6	10.9	6.3	1.3	.1	0	0
April.....	40	34	74	14.1	5.9	5.5	1.3	1.2	.2	0	0
May.....	41	54	70	13.5	2.7	5.9	4.4	.1	.4	Trace	Trace
June.....	33	150	72	11.5	2.9	3.4	4.2	.1	.9	0	0
July.....	12	16	81	13.7	5.4	0	8.3	0	0	0	0
September.....	100	1	100	20.0	0	0	10.0	10.0	0	0	0
October.....	60	15	47	4.5	1.9	0	2.4	0	.2	0	0
November.....	40	569	55	3.7	1.3	Trace	1.9	.2	.3	Trace	Trace
December.....	41	1,291	57	3.8	1.7	.6	.9	.2	.4	Trace	Trace
Total.....	41	3,206	64	7.6	2.6	2.5	1.8	.3	.4	Trace	Trace

## ANALYSIS OF FLORIDA DATA BY MONTHS

January.....	13	124	24	1.1	0.7	0.2	0.1	Trace	Trace	0	0.1
February.....	10	199	29	1.3	.3	.2	.2	0	0.1	.5	Trace
March.....	10	232	32	1.8	.6	.4	.3	.2	Trace	.3	Trace
April.....	9	248	72	5.6	2.2	.9	1.6	.7	.1	.1	Trace
May.....	12	268	68	7.1	2.2	1.4	1.7	.2	.7	.9	Trace
June.....	8	51	86	12.9	2.7	4.2	4.8	.3	.3	0	.6
November.....	100	1	0	0	0	0	0	0	0	0	0
December.....	14	8	13	.1	0	0	.1	0	0	0	0
Total.....	10	1,131	50	4.2	1.4	.8	1.1	.3	.2	.4	Trace

<sup>1</sup> Early blight, late blight, and the nonparasitic trouble blackheart included with decay.<sup>2</sup> Caused by *Sclerotinia* spp.<sup>4</sup> Caused by *Erwinia carotovora*.<sup>3</sup> Caused by *Septoria* spp.<sup>5</sup> Caused by *Cercospora apii*.

## CORN (GREEN)

Nearly 22,000 carlots of sweet corn were unloaded during 1936-42, the years when inspections were made. Ninety-six percent of all unloads were truck shipments, practically all of which originated in New Jersey and New York. The other 4 percent were rail shipments, approximately 75 percent of which were from the States covered by the present inspections.

Inspections were made on 344 carlots, or 35 percent of all rail unloads. Decay (type not specified), averaging 6.3 percent per carlot showing decay, was reported in 8 carlots, or 2 percent of those inspected. Worm injury, averaging 20.5 percent per carlot showing worm injury, was found in 301 carlots.

All corn inspections are summarized in table 24. Decay per carlot inspected averaged 0.1 percent for the entire period. Worm injury varied annually from 10 to 26 percent per carlot inspected, with an average of 18 percent. The majority of the carlots were from Texas. The least worm injury occurred in corn from Texas and the most in the few carlots from South Carolina.

TABLE 24.—Summary of corn (green) inspections, 1936-42.

Year or State	Carlots inspected		Percentage of carlots inspected showing decay	Average decay per carlot inspected	Average worm <sup>1</sup> injury per carlot inspected
	Percentage of New York City rail unloads	Total			
	Percent	Number			
1936.....	30	80	0	0	26
1937.....	16	25	0	0	18
1938.....	32	70	6	.2	14
1939.....	33	43	7	.8	19
1940.....	54	50	0	0	17
1941.....	76	53	0	0	12
1942.....	55	23	4	Trace	10
Total.....	35	344	2	.1	18

  

ANALYSIS BY STATES					
California.....	100	5	0	0	29
Florida.....	23	38	3	.1	29
Louisiana.....	14	3	0	0	21
South Carolina.....	9	7	0	0	35
Texas.....	55	260	2	.1	15
Unknown.....		31	6	.3	19
Total.....		344	2	.1	18

<sup>1</sup> Corn earworm (*Heliothis armigera* (Hbn.)).

## CUCUMBERS

Over 19,000 carlots of domestic cucumbers were unloaded during the 7-year period. Two percent were boat shipments; 57 percent were truck shipments from many States. Rail shipments constituted 41 percent of the unloads; over half were from the States listed in table 25. Nearly 1,600 carlots were brought in by boat from Cuba and Puerto Rico.

Inspections were made on 414 carlots, or 5 percent of all rail unloads. Distribution of decay<sup>17</sup> within them was as follows:

Decay class (percent):	Carlots in indicated decay class		Decay class (percent)—Continued	Carlots in indicated decay class	
	Number	Percent		Number	Percent
0-----	193	46.6	15-19-----	5	1.2
Trace-4-----	158	38.2	20-24-----	2	.5
5-9-----	48	11.6			
10-14-----	8	1.9			

Decay, averaging 3.8 percent per carlot showing decay, was found in 221 carlots, or 53 percent of those inspected. Distribution of decay by types was as follows:

Kind of decay:	Distribution		Kind of decay—Con.	Distribution	
	Carlots (number)	Average per carlot (percent)		Carlots (number)	Average per carlot (percent)
Bacterial soft rot---	123	2.6	Bacterial spot-----	5	3.0
Cottony leak-----	46	4.7	Cladosporium rot--	2	1.0
Watery soft rot-----	76	2.8	Other decay-----	31	2.7

A summary of all cucumber inspections is presented in table 25. Decay per carlot inspected was lowest (1.1 percent) in 1939 and highest (3.2 percent) in 1936 and averaged 2.0 percent for the entire 7-year period. Bacterial soft rot was the greatest single factor of spoilage.

TABLE 25.—Summary of cucumber inspections, 1935-42

ANALYSIS BY YEARS

Year or State	Carlots inspected		Percentage of carlots inspected showing decay	Average decay <sup>1</sup> per carlot inspected						
	Percentage of New York City rail unloads	Total		Total of decays	Bacterial soft rot <sup>2</sup>	Cottony leak <sup>3</sup>	Watery soft rot <sup>4</sup>	Bacterial spot <sup>5</sup>	Cladosporium rot <sup>6</sup>	Other decay
1935-----	13	45	42	1.5	0.1	0	1.2	0	0	0.2
1936-----	10	129	70	3.2	1.0	1.2	.8	0	0	.2
1937-----	10	101	46	1.7	1.0	.2	.4	.1	0	Trace
1938-----	5	67	42	1.2	.6	.4	.1	.1	Trace	0
1939-----	1	17	41	1.1	.4	0	0	.1	0	.6
1940-----	2	15	33	1.5	.5	.2	.7	0	0	.1
1941-----	2	16	38	1.2	.3	.4	0	0	0	.5
1942-----	3	24	83	2.4	.8	.3	.2	0	0	1.1
Total-----	5	414	53	2.0	.8	.5	.5	Trace	Trace	.2

ANALYSIS BY STATES

Alabama-----	10	20	45	1.1	0.9	0.1	0.1	0	0	0
Florida-----	9	254	51	1.6	.7	.2	.5	Trace	Trace	.2
Louisiana-----	11	14	43	1.2	.9	0	.3	0	0	0
South Carolina-----	1	15	21	1.5	.1	.7	0	.3	0	.4
Texas-----	54	37	84	5.6	1.1	2.7	1.6	0	0	.2
Unknown-----		74	58	2.4	.9	.8	.4	Trace	Trace	.3
Total-----		414	53	2.0	.8	.5	.5	Trace	Trace	.2

<sup>1</sup> Bacterial spot included with decay.

<sup>2</sup> Caused by *Erwinia carotovora*.

<sup>3</sup> Caused by *Pythium aphanidermatum*.

<sup>4</sup> Caused by *Sclerotinia* spp.

<sup>5</sup> Caused by *Pseudomonas lachrymans*.

<sup>6</sup> Caused by *Cladosporium cucumerinum*.

<sup>17</sup> Bacterial spot included with decay.

Cottony leak and watery soft rot, each responsible for one-fourth of the spoilage, were next in importance. Bacterial spot was reported only during 1937-39. Decay was fairly uniform in shipments from the different States except Texas; it was considerably higher in shipments from that State. Most of the carlots inspected, however, came from Florida.

### ENDIVE (CHICORY)

Nearly 4,700 carlots of endive were unloaded during the 7-year period. Truck shipments, most of which originated in New York (Long Island and elsewhere) and New Jersey, constituted 79 percent of all unloads. Rail shipments, almost entirely from the States covered by these inspections but chiefly from California, made up 21 percent of the unloads.

Inspections were made on 607 carlots, or 62 percent of all rail unloads. Distribution of decay within them was as follows.

Decay class (percent):	<i>Carlots in indicated decay class</i>		Decay class(percent)—	<i>Carlots in indicated decay class</i>	
	<i>Number</i>	<i>Percent</i>		<i>Number</i>	<i>Percent</i>
0-----	192	31.6	Continued		
Trace-4-----	104	17.1	50-54-----	12	2.0
5-9-----	104	17.1	55-59-----	5	.8
10-14-----	47	7.7	60-64-----	10	1.6
15-19-----	37	6.1	65-69-----	5	.8
20-24-----	24	4.0	70-74-----	8	1.3
25-29-----	17	2.8	75-79-----	3	.5
30-34-----	16	2.6	80-84-----	3	.5
35-39-----	3	.5	85-89-----	1	.2
40-44-----	7	1.2	90-94-----	1	.2
45-49-----	8	1.3			

Decay, averaging 17.1 percent per carlot showing decay, was reported from 415 carlots, or 68 percent of those inspected. Distribution of decay by types was as follows:

Kind of decay:	<i>Distribution</i>	
	<i>Carlots (number)</i>	<i>Average per carlot (percent)</i>
Bacterial soft rot-----	389	16.3
Watery soft rot-----	44	14.6
Other decay-----	10	12.9

All endive inspections are summarized in table 26. Bacterial soft rot was responsible for most of the decay reported each year except 1935. Watery soft rot was reported each year except 1940 and was most prevalent in 1942. Decay per carlot inspected ranged from 5.8 to 17.3 percent and averaged 11.7 percent for the entire period. Carlots from California showed more decay than those from Arizona, Florida, or Texas; however, only a few carlots from the last three States were inspected.

TABLE 26.—Summary of endive inspections, 1935-42

## ANALYSIS BY YEARS

Year or State	Carlots inspected		Percent- age of carlots inspected showing decay	Average decay per carlot inspected			
	Percent- age of New York City rail unloads	Total		Total of decays	Bacterial soft rot <sup>1</sup>	Watery soft rot <sup>2</sup>	Other decay
	Percent	Number	Percent	Percent	Percent	Percent	Percent
1935.....	97	31	42	5.8	2.5	3.3	0
1936.....	67	97	72	16.2	14.9	1.3	0
1937.....	56	70	80	17.3	16.3	1.0	0
1938.....	57	67	70	12.7	12.2	.1	.4
1939.....	65	80	65	9.2	8.2	.3	.7
1940.....	61	74	45	6.6	6.0	0	.6
1941.....	71	120	80	11.2	10.6	.6	0
1942.....	46	68	71	10.7	7.1	3.6	Trace
Total.....	62	607	68	11.7	10.4	1.1	.2

## ANALYSIS BY STATES

	Percent	Number	Percent	Percent	Percent	Percent	Percent
Arizona.....	30	15	67	8.1	7.8	0.3	0
California.....	66	561	69	12.0	10.7	1.1	.2
Florida.....	13	5	60	6.0	6.0	0	0
Texas.....	39	18	61	4.2	4.2	0	0
Unknown.....		8	58	16.3	12.6	3.7	0
Total.....		607	68	11.7	10.4	1.1	.2

<sup>1</sup> Caused by *Erwinia carotovora*.<sup>2</sup> Caused by *Sclerotinia* spp.

## ESCAROLE

Over 10,500 carlots of escarole were unloaded during the 7-year period. Rail shipments, practically all of which originated in Florida, constituted 34 percent of all unloads. Truck shipments, chiefly from New York, New Jersey, and to a much less extent from Florida, accounted for nearly all of the other 66 percent.

Inspections were made on 322 Florida carlots, or 9 percent of all rail unloads. Distribution of decay within them was as follows:

Decay class (percent):	Carlots in indicated decay class		Decay class (percent)— Continued	Carlots in indicated decay class	
	Number	Percent		Number	Percent
0.....	137	42.5	45-49.....	3	0.9
Trace-4.....	76	23.6	50-54.....	8	2.5
5-9.....	30	9.3	55-59.....	0	0
10-14.....	17	5.3	60-64.....	1	.3
15-19.....	5	1.6	65-69.....	1	.3
20-24.....	10	3.1	70-74.....	2	.6
25-29.....	13	4.0	75-79.....	1	.3
30-34.....	6	1.9	80-84.....	1	.3
35-39.....	3	.9			
40-44.....	8	2.5			

Decay, averaging 14.6 percent per carlot showing decay, was found in 185 carlots, or 57 percent of those inspected. Distribution of decay by types was as follows:

Kind of decay:	Distribution	
	Carlots (number)	Average per carlot (percent)
Bacterial soft rot.....	166	14.1
Watery soft rot.....	17	19.2
Other decay.....	17	2.0

From table 27, in which all escarole inspections are summarized, it will be seen that decay per carlot inspected ranged from 4.5 to 16.5 percent and averaged 8.4 percent. Most of the decay was bacterial soft rot, which varied rather widely in amount from year to year. Watery soft rot was more prevalent in 1938 and 1940 than in the other years.

TABLE 27.—Summary of escarole inspections, 1935-42<sup>1</sup>

Year	Carlots inspected		Percentage of carlots inspected showing decay	Average decay per carlot inspected			
	Percentage of New York City rail unloads	Total		Total of decays	Bacterial soft rot <sup>2</sup>	Watery soft rot <sup>3</sup>	Other decay
	Percent	Number	Percent	Percent	Percent	Percent	Percent
1935.....	100	4	50	15.0	15.0	0	0
1936.....	3	13	77	14.5	14.1	0	.4
1937.....	2	10	40	9.5	9.5	0	0
1938.....	5	26	65	16.5	15.0	1.5	0
1939.....	10	50	52	4.5	4.5	0	0
1940.....	13	69	67	13.9	10.0	3.6	.3
1941.....	10	45	42	4.5	4.4	.1	0
1942.....	20	105	58	5.1	4.7	.3	.1
Total.....	9	322	57	8.4	7.3	1.0	.1

<sup>1</sup> All from Florida.<sup>2</sup> Caused by *Erwinia carotovora*.<sup>3</sup> Caused by *Sclerotinia* spp.

## LETTUCE

Nearly 68,000 carlots of lettuce were unloaded during the 7-year period. Seventy percent were rail shipments from a number of States, chiefly California and Arizona; approximately 93 percent of the rail unloads originated in the States covered by the present inspections. The remaining 30 percent of all unloads were truck shipments from a number of nearby and South Atlantic States; New York (Long Island and elsewhere) and New Jersey were by far the most important of them.

Inspections were made on 24,737 carlots, or approximately 52 percent of all rail unloads. Distribution of decay<sup>18</sup> within them was as follows:

Decay class (percent):	Carlots in indicated decay class		Decay class (percent)—	Carlots in indicated decay class	
	Number	Percent		Number	Percent
0.....	7,876	31.8	Continued		
Trace-4.....	4,169	16.9	50-54.....	222	0.9
5-9.....	2,978	12.0	55-59.....	162	.7
10-14.....	2,511	10.1	60-64.....	131	.5
15-19.....	1,704	6.9	65-69.....	97	.4
20-24.....	1,380	5.6	70-74.....	71	.3
25-29.....	1,053	4.3	75-79.....	67	.3
30-34.....	776	3.1	80-84.....	73	.3
35-39.....	629	2.5	85-89.....	30	.1
40-44.....	431	1.7	90-94.....	46	.2
45-49.....	313	1.3	95-99.....	18	.1

Decay, averaging 16.8 percent per carlot showing decay, was found in 16,861 carlots, or 68 percent of those inspected. Distribution of decay by types was as follows:

<sup>18</sup> Tipburn included with decay.

Kind of decay:	Distribution		Kind of decay—Con.	Distribution	
	Carlots (number)	Average per carlot (percent)		Carlots (number)	Average per carlot (percent)
Tipburn.....	10, 853	17. 5	Watery soft rot..	11	8. 3
Bacterial soft rot..	14, 223	6. 5	Other decay.....	44	11. 3
Gray mold rot....	180	3. 6			

A summary of all lettuce inspections is given in table 28. It will be noted that most of the carlots were from California and Arizona. Except in 1942 tipburn was more prevalent than bacterial soft rot; the former accounted for about two-thirds of the spoilage and the

TABLE 28.—Summary of lettuce inspections, 1935-42

## ANALYSIS BY YEARS

Year, State, or month	Carlots inspected		Percentage of carlots inspected showing decay	Average decay <sup>1</sup> per carlot inspected					
	Percentage of New York City rail unloads	Total		Total of decays	Tipburn	Bacterial soft rot <sup>2</sup>	Gray mold rot <sup>3</sup>	Watery soft rot <sup>4</sup>	Other decay
1935.....	55	1, 885	68	9. 6	6. 0	3. 6	0	0	Trace
1936.....	60	4, 147	68	14. 0	10. 3	3. 7	Trace	Trace	Trace
1937.....	56	3, 984	69	13. 0	7. 6	5. 2	. 1	Trace	0. 1
1938.....	54	3, 441	72	10. 7	7. 0	3. 7	Trace	Trace	Trace
1939.....	47	3, 453	66	11. 6	8. 4	3. 2	Trace	0	Trace
1940.....	53	3, 435	65	10. 7	7. 6	3. 0	. 1	0	0
1941.....	49	3, 125	72	10. 5	7. 4	3. 0	. 1	0	Trace
1942.....	37	1, 267	57	7. 7	2. 7	5. 0	Trace	0	0
Total.....	52	24, 737	68	11. 5	7. 7	3. 8	Trace	Trace	Trace

## ANALYSIS BY STATES

Arizona.....	59	5, 085	58	8. 3	4. 1	4. 1	Trace	Trace	0. 1
California.....	60	18, 357	71	12. 5	8. 9	3. 6	Trace	Trace	Trace
Colorado.....	95	26	42	6. 3	3. 0	3. 3	0	0	0
Idaho.....	69	196	53	6. 6	5. 5	1. 1	0	0	0
New York.....	8	279	59	6. 5	. 7	5. 7	. 1	0	0
Oregon.....	41	41	61	9. 9	8. 2	1. 7	0	0	0
South Carolina.....	10	46	98	37. 7	31. 0	6. 7	Trace	0	0
Virginia.....	43	34	94	24. 2	19. 8	4. 4	0	0	0
Washington.....	78	138	82	8. 1	2. 6	5. 5	0	0	0
Unknown.....		535	50	9. 3	4. 9	4. 3	. 1	0	0
Total.....		24, 737	68	11. 5	7. 7	3. 8	Trace	Trace	Trace

## ANALYSIS OF CALIFORNIA DATA BY MONTHS

January.....	57	1, 206	17	1. 0	0. 8	0. 2	0	Trace	Trace
February.....	55	1, 623	25	1. 5	1. 1	. 4	Trace	0	0
March.....	61	922	50	3. 9	2. 3	1. 6	Trace	0	Trace
April.....	97	844	74	8. 9	2. 4	6. 5	0	0	0
May.....	59	2, 376	92	18. 0	9. 5	8. 5	Trace	0	Trace
June.....	55	765	89	18. 6	13. 1	5. 5	0	0	0
July.....	50	1, 422	91	24. 0	19. 9	4. 1	0	Trace	Trace
August.....	62	2, 448	93	21. 3	17. 4	3. 8	Trace	Trace	. 1
September.....	61	2, 098	86	16. 3	12. 6	3. 6	. 1	Trace	Trace
October.....	61	1, 898	76	11. 6	8. 9	2. 7	Trace	Trace	Trace
November.....	59	1, 907	71	6. 4	3. 7	2. 5	. 2	Trace	Trace
December.....	57	848	51	3. 6	2. 1	1. 5	Trace	0	Trace
Total.....	60	18, 357	71	12. 5	8. 9	3. 6	Trace	Trace	Trace

<sup>1</sup> Tipburn included with decay.<sup>2</sup> Caused by *Erwinia carotovora*.<sup>3</sup> Caused by *Botrytis* spp.<sup>4</sup> Caused by *Sclerotinia* spp.

latter for about one-third. Total spoilage ranged from 7.7 to 14.0 percent and for the entire 7-year period averaged 11.5 percent per carlot inspected. Tipburn varied in amount from State to State, with a range of 0.7 percent in shipments from New York to 31.0 percent in those from South Carolina. Bacterial soft rot ranged from 1.1 to 6.7 percent. In the analysis of California data by months it will be noted that tipburn was most important from May through October, with greatest prevalence in July and August. Bacterial soft rot was most prevalent in April and May, decreased in amount thereafter to the end of the year, and was least prevalent in January and February.

### MUSKMELONS

A separate report <sup>19</sup> has already been made on market inspections of cantaloups and related melons. The present discussion is based on part of the material presented there. It will be noted that the period covered is 1933 through 1935 and 1941, so that the data are not entirely comparable with those on the other commodities.

### CANTALOUPS

Over 13,500 carlots of cantaloups were unloaded during the 4 years for which data were analyzed. Truck shipments from a number of States, chiefly Maryland, Delaware, and New Jersey, constituted 32 percent of all unloads. The remaining 68 percent were rail shipments, 86 percent of which originated in California, Arizona, and Colorado (chiefly California).

Inspections were made on 3,294 carlots, or 36 percent of all rail unloads. Decay or mold was found in 50 percent of the carlots (table 29). Mold and decay averaged 6.7 percent per carlot inspected. Mold was more prevalent than all decays combined. Fusarium rot, rhizopus rot, and alternaria rot were the most important decays reported.

### HONEY DEW MELONS

Over 7,600 carlots of domestic Honey Dew melons were unloaded during 4 years. Practically all were rail shipments from Arizona, California, and Colorado. Inspections were made on 4,181 carlots, or 55 percent of all unloads. Decay and mold averaging 2.2 percent per carlot inspected was reported from 41 percent of those inspected (table 29). Rhizopus rot was of chief importance and accounted for nearly half of the decay. Alternaria rot, cladosporium rot, and mold, in the order named, were next in importance.

### HONEY BALL AND MIXED MELONS

Over 3,800 carlots of Honey Ball melons and mixed melons were unloaded during the 4-year period. Practically all were rail shipments from California. Inspections were made on 2,415 carlots, or 63 per-

<sup>19</sup> WIANT, J. S. AN ANALYSIS OF MARKET INSPECTION REPORTS ON SPOILAGE OF CANTALOUPS AND RELATED MELONS. U. S. Bur. Plant Indus., Plant Dis. Rptr. Sup. 138: [145]-161. 1942. [Processed.]



cent of all such rail unloads. Mold or decay was reported from 42 percent of those inspected (table 29). Mold accounted for about half of the spoilage. Rhizopus rot, alternaria rot, and cladosporium rot, in the order named, were next in importance. For the entire 4 years spoilage averaged 4.3 percent per carlot inspected.

TABLE 29.—Summary of muskmelon inspections, 1933-35 and 1941

CANTALOUPS<sup>1</sup>

Year	Carlots inspected		Per-centage of carlots in-spected show-ing mold or decay	Average mold or decay per carlot inspected							
	Per-centage of New York City rail un-loads	Total		Total of decays and mold	Al-ternaria rot <sup>2</sup>	Clad-osporium rot <sup>3</sup>	Fusa-rium rot <sup>4</sup>	Phy-to-phtho-ra rot <sup>5</sup>	Rhi-zopus rot <sup>6</sup>	Other decay	Mold <sup>7</sup>
1933.....	16	389	66	8.3	1.3	-----	0.7	-----	1.2	0.6	4.5
1934.....	49	1,053	39	7.1	.9	-----	.7	-----	.2	.1	5.2
1935.....	40	827	35	3.7	.4	-----	.2	-----	.3	-----	2.8
1941.....	41	1,025	68	8.0	-----	0.5	1.0	0.1	1.3	Trace	5.1
Total.....	36	3,294	50	6.7	.5	.2	.7	Trace	.7	.1	4.5

HONEY DEW MELONS<sup>1</sup>

1933.....	46	800	53	4.0	1.2	-----	0.3	-----	2.1	0.2	0.2
1934.....	60	1,124	27	1.4	.7	-----	.1	-----	.5	Trace	.1
1935.....	62	1,335	29	1.5	.4	0.1	Trace	0.2	.5	-----	.3
1941.....	49	922	66	2.8	Trace	1.1	.5	Trace	1.2	Trace	Trace
Total.....	55	4,181	41	2.2	.5	.3	.1	.1	1.0	Trace	.2

HONEY BALL MELONS AND MIXED MELONS<sup>3</sup>

1933.....	32	283	56	7.5	1.3	-----	0.8	-----	1.9	0.5	3.0
1934.....	73	768	44	5.1	.7	-----	.3	-----	.9	.1	3.1
1935.....	75	748	36	2.4	.3	Trace	.1	0.2	.5	-----	1.3
1941:											
Mixed.....	57	271	47	1.8	-----	0.3	.2	-----	.3	-----	1.0
Honey Ball.....	80	345	36	5.9	-----	1.7	Trace	-----	1.5	-----	2.7
Total.....	63	2,415	42	4.3	.5	.3	.2	.1	.9	.1	2.2

<sup>1</sup> All from California, Arizona, and Colorado.<sup>2</sup> Caused by *Alternaria* spp.<sup>3</sup> Caused by *Cladosporium* spp.<sup>4</sup> Caused by *Fusarium* spp.<sup>5</sup> Caused by *Phytophthora* spp.<sup>6</sup> Caused by *Rhizopus* spp.<sup>7</sup> Caused by the fungi responsible for the various decays; melons with both mold and decay were listed under decay.<sup>8</sup> All from California.

## ONIONS

Nearly 47,000 carlots of domestic onions were unloaded during the 7-year period. Approximately 42 percent were rail shipments, practically all of which originated in the States covered by the present inspections. About 40 percent were truck shipments, mostly from New York, New Jersey, and Massachusetts. Boat shipments, chiefly from Texas and California, accounted for 18 percent of the unloads. Nearly 700 carlots were imported by boat from Chile and Argentina.

Inspections were made on 856 carlots, or 4 percent of all rail unloads. The distribution of decay within them was as follows:

Decay class (percent):	Carlots in indicated decay class		Decay class (percent)—	Carlots in indicated decay class	
	Number	Percent		Number	Percent
0-----	224	26.2	Continued		
Trace-4-----	419	49.0	45-49-----	4	0.5
5-9-----	74	8.6	50-54-----	3	.4
10-14-----	49	5.7	55-59-----	1	.1
15-19-----	30	3.5	60-64-----	0	0
20-24-----	11	1.3	65-69-----	1	.1
25-29-----	11	1.3	70-74-----	2	.2
30-34-----	9	1.0	75-79-----	1	.1
35-39-----	11	1.3	80-84-----	0	0
40-44-----	5	.6	85-89-----	1	.1

Decay, averaging 6.8 percent per carlot showing decay, was found in 632 carlots, or 74 percent of those inspected. Distribution of decay by types was as follows:

Kind of decay:	Distribution		Kind of decay—Con.	Distribution	
	Carlots (number)	Average per carlot (percent)		Carlots (number)	Average per carlot (percent)
Gray mold rot-----	400	5.8	Blue mold rot-----	6	2.2
Bacterial soft rot---	259	5.7	Fusarium rot-----	5	1.6
Black mold rot-----	44	7.9	Other decay-----	156	.8

TABLE 30.—Summary of onion inspections, 1935-42

ANALYSIS BY YEARS

Year or State	Carlots inspected		Percentage of carlots inspected showing decay	Average decay per carlot inspected						
	Percentage of New York City rail unloads	Total		Total of decays	Gray mold rot <sup>1</sup>	Bacterial soft rot <sup>2</sup>	Black mold rot <sup>3</sup>	Blue mold rot <sup>4</sup>	Fusarium rot <sup>5</sup>	Other decay
1935-----	1	17	76	5.9	3.2	2.7	0	0	0	0
1936-----	3	57	79	4.5	.6	2.5	.3	.1	Trace	1.0
1937-----	2	51	49	4.5	1.2	2.3	.6	Trace	0	.4
1938-----	1	23	43	4.6	1.6	.4	2.3	.3	0	0
1939-----	1	21	39	.9	.4	.4	.1	0	0	Trace
1940-----	5	123	45	2.1	.5	1.3	.3	0	0	Trace
1941-----	7	206	77	6.3	4.0	2.3	Trace	Trace	Trace	Trace
1942-----	13	358	89	5.7	3.5	1.4	.6	0	0	.2
Total-----	4	856	74	5.0	2.7	1.7	.4	Trace	Trace	.2

ANALYSIS BY STATES

California-----	8	28	43	1.9	0.6	1.0	-0.2	0.1	0	Trace
Colorado-----	2	22	86	3.7	1.7	1.7	0	0	.1	0.2
Georgia-----	51	23	100	17.2	13.1	4.0	0	0	0	.1
Idaho-----	1	14	44	2.4	1.0	1.3	0	.1	0	0
Indiana-----	1	10	70	5.6	2.4	3.2	0	0	0	0
Michigan-----	1	22	50	2.4	1.4	1.0	Trace	0	0	0
New York-----	.1	10	60	1.2	.3	.8	0	0	0	.1
Ohio-----	2	7	100	5.6	2.6	2.9	0	0	0	.1
Oregon-----	3	6	67	1.5	Trace	.3	0	.5	.5	.2
Texas-----	17	693	75	5.0	2.7	1.7	.5	Trace	0	.1
Washington-----	1	6	83	5.5	1.3	1.0	0	0	.5	2.7
Unknown-----		15	67	6.1	1.5	1.4	.4	.4	0	2.4
Total-----		856	74	5.0	2.7	1.7	.4	Trace	Trace	.2

<sup>1</sup> Caused by *Botrytis* spp.

<sup>2</sup> Caused by *Erwinia carotovora*.

<sup>3</sup> Caused by *Aspergillus niger*.

<sup>4</sup> Caused by *Penicillium* spp.

<sup>5</sup> Caused by *Fusarium* spp.

All onion inspections are summarized in table 30. Decay per carlot inspected ranged from 0.9 to 6.3 percent and for the entire period averaged 5.0 percent. Gray mold rot accounted for a little over half of the decay. Bacterial soft rot was second in importance and black mold rot third.

In the analysis by States it should be kept in mind that comparatively few carlots were inspected from any State except Texas. New York in particular was poorly represented in the inspections. In the carlots from Texas the distribution of decay was practically identical with that for all States. The least decay was found in shipments from New York and the most in those from Georgia.

### PARSLEY

Over 4,500 carlots of parsley were unloaded during the 7-year period. Rail shipments, almost entirely from California and Texas, constituted 23 percent of the unloads. Nearly all of the remaining 77 percent were truck shipments from New York (Long Island and elsewhere) and New Jersey.

Inspections were made on 816 carlots, or 76 percent of all rail unloads. Distribution of decay within them was as follows:

Decay class (percent):	Carlots in indicated decay class		Decay class (percent)—	Carlots in indicated decay class	
	Number	Percent		Number	Percent
0-----	734	89.9	Continued		
Trace-4-----	18	2.2	40-44-----	4	0.5
5-9-----	10	1.2	45-49-----	2	.2
10-14-----	8	1.0	50-54-----	5	.6
15-19-----	9	1.1	55-59-----	2	.2
20-24-----	6	.7	60-64-----	2	.2
25-29-----	4	.5	65-69-----	2	.2
30-34-----	0	0	70-74-----	1	.1
35-39-----	7	.9	75-79-----	2	.2

Decay, averaging 23.1 percent per carlot showing decay, was found in 82 carlots, or 10 percent of those inspected. Distribution of decay by types was as follows:

Kind of decay:	Distribution	
	Carlots (number)	Average per carlot (percent)
Bacterial soft rot-----	81	22.3
Watery soft rot-----	2	44.0

The parsley inspections are summarized in table 31. There it will be seen that an average of 2.3 percent decay was found per carlot inspected. Decay did not vary greatly in amount from year to year and was higher in Texas carlots than in those from California. Most of the decay was bacterial soft rot.

TABLE 31.—Summary of parsley inspections, 1935-42

## ANALYSIS BY YEARS

Year or State	Carlots inspected		Percentage of carlots inspected showing decay	Average decay per carlot inspected		
	Percentage of New York City rail unloads	Total		Total of decays	Bacterial soft rot <sup>1</sup>	Watery soft rot <sup>2</sup>
1935.....	100	20	0	0	0	0
1936.....	100	157	4	1.4	1.1	.3
1937.....	89	106	17	2.7	2.7	0
1938.....	100	156	13	3.6	3.4	.2
1939.....	86	126	8	2.2	2.2	0
1940.....	63	111	8	1.6	1.6	0
1941.....	47	74	11	3.6	3.6	0
1942.....	46	66	15	1.4	1.4	0
Total.....	76	816	10	2.3	2.2	.1

## ANALYSIS BY STATES

California.....	80	74	8	1.2	1.2	0
Texas.....	76	727	10	2.3	2.2	.1
Unknown.....	-----	15	20	8.5	8.5	0
Total.....	-----	816	10	2.3	2.2	.1

<sup>1</sup> Caused by *Erwinia carotovora*.<sup>2</sup> Caused by *Sclerotinia* spp.

## PEAS

Nearly 22,000 carlots of peas were unloaded during the 7-year period. Rail shipments comprised 76 percent of the unloads. Practically all were from the States covered by the present inspections. Most of the other 24 percent of unloads were truck shipments from many States, chiefly New York (Long Island and elsewhere), North Carolina, Florida, South Carolina, and New Jersey.

Inspections were made on 8,676 carlots, or 53 percent of all rail unloads. Distribution of decay<sup>20</sup> within them was as follows:

Decay class (percent):	Carlots in indicated decay class		Decay class (percent)—	Carlots in indicated decay class	
	Number	Percent		Number	Percent
0.....	6,951	80.1	Continued		
Trace-4.....	1,333	15.4	45-49.....	2	Trace
5-9.....	194	2.2	50-54.....	2	Trace
10-14.....	77	.9	55-59.....	0	0
15-19.....	48	.6	60-64.....	2	Trace
20-24.....	21	.2	65-69.....	1	Trace
25-29.....	15	.2	70-74.....	0	0
30-34.....	12	.1	75-79.....	2	Trace
35-39.....	6	.1	80-84.....	1	Trace
40-44.....	9	.1			

Decay, averaging 4.3 percent per carlot showing decay, was found in 1,725 carlots, or 20 percent of those inspected. Distribution of decay by types was as follows:

<sup>20</sup> Pod spot, scab, and bacterial blight included with decay.

Kind of decay:	Distribution		Kind of decay—Con.	Distribution	
	Carlots (number)	Average per carlot (percent)		Carlots (number)	Average per carlot (percent)
Bacterial soft rot	1,045	3.5	Scab	22	15.1
Watery soft rot	689	3.1	Bacterial blight	3	4.0
Pod spot	77	11.1	Other decay	27	3.6
Gray mold rot	152	2.4			

All pea inspections are summarized in table 32. Decay per carlot inspected ranged from 0.1 to 1.9 percent and averaged 0.9 percent for the entire period. Somewhat over half was due to bacterial soft rot and one-third to watery soft rot. In the analysis by States it will be noted that a majority of the shipments originated in California, but that large numbers came from Washington and Colorado. For these three States decay was highest (1.7 percent) in Washington shipments and lowest (0.3 percent) in those from Colorado.

TABLE 32.—Summary of pea inspections, 1935-42

## ANALYSIS BY YEARS

Year or State	Carlots inspected		Percentage of carlots inspected showing decay	Average decay <sup>1</sup> per carlot inspected							
	Percentage of New York City rail unloads	Total		Total of decays	Bacterial soft rot <sup>2</sup>	Watery soft rot <sup>3</sup>	Pod spot <sup>4</sup>	Gray mold rot <sup>5</sup>	Scab <sup>6</sup>	Bacterial blight <sup>7</sup>	Other decay
				Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent
1935	66	913	6	0.1	0.1	Trace	0	Trace	0	0	Trace
1936	60	1,765	22	1.1	.8	0.2	Trace	0.1	0	Trace	Trace
1937	57	1,468	14	.5	.2	Trace	.2	.1	0	0	Trace
1938	51	1,155	17	.9	.3	.2	.1	Trace	.3	Trace	Trace
1939	48	1,119	16	.8	.5	.2	.1	Trace	0	Trace	0
1940	54	1,139	19	.8	.5	.2	.1	Trace	0	0	0
1941	45	829	40	1.9	.4	1.1	.4	Trace	0	0	0
1942	31	288	50	1.1	.4	.6	Trace	.1	0	0	0
Total	53	8,676	20	.9	.5	.3	.1	Trace	Trace	Trace	Trace

## ANALYSIS BY STATES

Arizona	100	25	24	1.9	0.2	0	1.3	Trace	0.4	0	0
California	64	5,553	17	.7	.3	.2	.1	Trace	.1	Trace	Trace
Colorado	45	714	16	.3	.1	.2	0	Trace	0	0	Trace
Florida	13	173	20	.9	.7	.1	Trace	0.1	0	0	0
Idaho	19	279	21	1.1	.6	.4	0	.1	0	0	Trace
Mississippi	49	95	18	1.0	.5	.1	.2	Trace	0	.1	.1
Montana	58	15	27	.7	0	.7	0	0	0	0	0
Oregon	27	34	26	.4	.1	.3	0	0	0	0	Trace
South Carolina	5	10	10	.1	.1	0	0	0	0	0	0
Texas	40	75	27	.9	.3	.5	0	.1	0	0	0
Utah	2	6	17	.5	.3	0	0	.2	0	0	0
Virginia	4	9	11	.1	0	.1	0	0	0	0	0
Washington	56	938	30	1.7	1.1	.5	0	.1	0	0	Trace
Unknown		750	29	1.4	.9	.3	.1	Trace	Trace	Trace	Trace
Total		8,676	20	.9	.5	.3	.1	Trace	Trace	Trace	Trace

<sup>1</sup> Pod spot, scab, and bacterial blight included with decay.<sup>2</sup> Caused by *Erwinia carotovora*.<sup>3</sup> Caused by *Sclerotinia* sp.<sup>4</sup> Caused by *Mycosphaerella pinodes*.<sup>5</sup> Caused by *Botrytis* spp.<sup>6</sup> Caused by *Cladosporium pisicola*.<sup>7</sup> Caused by *Pseudomonas pisi*.

## PEPPERS

Nearly 21,000 carlots of peppers were unloaded during the 7-year period. Approximately 14 percent of the unloads were rail shipments, nearly 90 percent of which originated in the States covered by the

present inspections. Boat shipments, chiefly from Florida and Texas, accounted for 24 percent; truck shipments from a number of States, chiefly New Jersey, New York, Florida, and North Carolina, comprised 62 percent of the total unloads.

Inspections were made on 659 carlots, or 23 percent of all rail unloads. Distribution of decay within them was as follows:

Decay class (percent):	Carlots in indicated decay class		Decay class (percent)—	Carlots in indicated decay class	
	Number	Percent		Number	Percent
0-----	261	39.6	Continued		
Trace-4-----	250	37.9	50-54-----	0	0
5-9-----	88	13.4	55-59-----	0	0
10-14-----	27	4.1	60-64-----	0	0
15-19-----	8	1.2	65-69-----	0	0
20-24-----	11	1.7	70-74-----	0	0
25-29-----	6	.9	75-79-----	1	.2
30-34-----	4	.6	80-84-----	2	.3
35-39-----	0	0	85-89-----	0	0
40-44-----	0	0	90-94-----	1	.2
45-49-----	0	0			

Decay, averaging 5.9 percent per carlot showing decay, was found in 398 carlots, or 60 percent of those inspected. Distribution of decay by types was as follows:

Kind of decay:	Distribution		Kind of decay—Con.	Distribution	
	Carlots (number)	Average per carlot (percent)		Carlots (number)	Average per carlot (percent)
Bacterial soft rot---	276	4.2	Watery soft rot-----	5	4.6
Rhizopus rot-----	128	4.9	Other decay-----	33	7.4
Gray mold rot-----	33	8.5			

TABLE 33.—Summary of pepper inspections, 1935-42

ANALYSIS BY YEARS

Year or State	Carlots inspected			Average decay per carlot inspected				
	Percent- age of New York City rail unloads	Total	Percent- age of carlots inspected show- ing de- cay	Total of	Bacte- rial soft rot <sup>1</sup>	Rhizo- pus rot <sup>2</sup>	Gray mold rot <sup>3</sup>	Other decay
				Percent	Percent	Percent	Percent	Percent
1935-----	51	59	42	1.4	1.1	0.1	0	0.2
1936-----	41	214	62	3.9	1.8	1.1	.5	.5
1937-----	32	125	66	4.3	3.1	1.1	Trace	.1
1938-----	35	120	67	4.6	1.7	1.1	.8	1.0
1939-----	9	22	23	.5	.3	Trace	.2	0
1940-----	18	67	51	3.5	1.9	.6	.8	.2
1941-----	9	38	68	1.8	.5	1.1	.1	.1
1942-----	3	14	93	3.4	.2	3.2	0	Trace
Total-----	23	659	60	3.6	1.8	1.0	.4	.4

ANALYSIS BY STATES

State	Percent- age of New York City rail unloads	Total	Percent- age of carlots inspected show- ing de- cay	Total of	Bacte- rial soft rot <sup>1</sup>	Rhizo- pus rot <sup>2</sup>	Gray mold rot <sup>3</sup>	Other decay
	Percent	Number	Percent	Percent	Percent	Percent	Percent	Percent
California-----	62	103	50	4.8	1.4	0.1	2.2	1.1
Florida-----	16	304	64	3.0	2.1	.8	Trace	.1
Louisiana-----	27	51	65	3.4	1.4	2.0	0	Trace
Texas-----	50	119	51	2.4	1.0	.8	.4	.2
Unknown-----		82	73	6.2	2.6	2.5	0	1.1
Total-----		659	60	3.6	1.8	1.0	.4	.4

<sup>1</sup> Caused by *Erwinia carotovora*.

<sup>2</sup> Caused by *Rhizopus* spp.

<sup>3</sup> Caused by *Botrytis* spp.

A summary of all pepper inspections is found in table 33. Decay per carlot inspected ranged from 0.5 to 4.6 percent and averaged 3.6 percent for the entire 7-year period. Half of it was due to bacterial soft rot. The least decay was found in peppers from Texas and the most in those from California.

### POTATOES

Approximately 150,000 carlots of potatoes were unloaded during 1936-42, the years when inspections were made. Rail shipments comprised 50 percent of the total. About 95 percent of the rail shipments originated in the States covered by the present inspections. Truck shipments from a number of States, chiefly from New York (Long Island), New Jersey, and Virginia, constituted 45 percent; boat shipments, chiefly from Florida, accounted for the remaining 5 percent.

Inspections were made on 2,534 carlots, or 3 percent of all rail unloads. Distribution of decay<sup>21</sup> within them was as follows:

Decay class (percent):	Carlots in indicated decay class		Decay class (percent)—	Carlots in indicated decay class	
	Number	Percent		Number	Percent
0-----	1,428	56.4	Continued		
Trace-4-----	980	38.7	35-39-----	4	0.2
5-9-----	80	3.2	40-44-----	1	Trace
10-14-----	22	.9	45-49-----	0	0
15-19-----	9	.4	50-54-----	0	0
20-24-----	4	.2	55-59-----	1	Trace
25-29-----	4	.2	60-64-----	1	Trace
30-34-----	0	0			

Decay, averaging 2.4 percent per carlot showing decay, was found in 1,106 carlots, or 44 percent of those inspected. Distribution of decay by types was as follows:

Kind of decay:	Distribution		Kind of decay—Con.	Distribution	
	Carlots (number)	Average per carlot (percent)		Carlots (number)	Average per carlot (percent)
Bacterial soft rot--	1,053	2.3	Brown sunken		
Late blight rot----	48	1.7	areas-----	6	5.5
Sclerotium rot----	39	1.8	Heat injury (scald)-	5	2.4
Fusarium rot-----	22	1.4	Other decay-----	10	1.2

A summary of all potato inspections is presented in table 34. It will be noted that the study covers chiefly early-crop potatoes; in fact only 11 carlots of Maine potatoes were included, although from 5,000 to 9,000 rail carlots were unloaded annually from that State. Likewise, Idaho was only poorly represented and none from New York was included.

Decay per carlot inspected ranged from 0.5 to 2.2 percent annually and averaged 1.0 percent for the entire period; practically all was bacterial soft rot. For the States represented by 100 or more carlots, decay was lowest in those from California and highest in those from South Carolina. When all States were considered, decay was lowest in carlots from Idaho and greatest in those from Texas.

<sup>21</sup> Heat injury and brown sunken areas included with decay.

TABLE 34.—Summary of potato inspections, 1936-42

## ANALYSIS BY YEARS

Year or State	Carlots inspected		Percentage of carlots inspected showing decay	Average decay <sup>1</sup> per carlot inspected							
	Percentage of New York City rail unloads	Total		Total of decays	Bacterial soft rot <sup>2</sup>	Late blight rot <sup>3</sup>	Sclerotium rot <sup>4</sup>	Brown sunken areas	Fusarium rot <sup>5</sup>	Heat injury (scald)	Other decay
1936.....	3	425	22	0.5	0.5	Trace	0	0	Trace	Trace	Trace
1937.....	4	459	43	1.3	1.1	0.1	.1	0	0	0	Trace
1938.....	5	490	45	1.1	1.0	.1	Trace	0	0	Trace	Trace
1939.....	3	331	35	1.0	.9	Trace	Trace	.1	0	0	Trace
1940.....	3	349	42	.9	.9	0	0	Trace	0	0	0
1941.....	2	193	82	2.2	2.1	Trace	0	0	.1	Trace	0
1942.....	3	287	60	.6	.6	Trace	0	0	Trace	0	0
Total....	3	2,534	44	1.0	1.0	Trace	Trace	Trace	Trace	Trace	Trace

## ANALYSIS BY STATES

Alabama.....	5	49	65	0.6	0.4	Trace	0	0	0.1	0.1	0
California....	7	175	46	.8	.7	Trace	0	.1	0	0	Trace
Florida.....	10	421	33	.9	.8	0.1	Trace	Trace	0	0	Trace
Idaho.....	1	67	42	.5	.3	Trace	0	0	.2	0	Trace
Maine.....	Trace	11	10	.9	.9	0	0	0	0	0	0
North Carolina.....	10	558	49	1.0	1.0	0	Trace	0	Trace	Trace	0
South Carolina.....	8	341	58	1.3	1.2	Trace	.1	0	0	Trace	0
Texas.....	41	43	44	4.5	4.5	0	0	0	0	0	0
Virginia.....	14	663	38	.9	.8	.1	Trace	0	Trace	Trace	Trace
Unknown.....		206	43	1.4	1.3	.1	Trace	0	Trace	Trace	Trace
Total.....		2,534	44	1.0	1.0	Trace	Trace	Trace	Trace	Trace	Trace

<sup>1</sup> Brown sunken areas and heat injury (scald) included with decay.<sup>2</sup> Caused by *Erwinia carotovora*.<sup>3</sup> Caused by *Phytophthora infestans*.<sup>4</sup> Caused by *Sclerotium rolfsii*.<sup>5</sup> Caused by *Fusarium* spp.

## RADISHES

Over 9,200 carlots of radishes were unloaded during the 7-year period. Truck shipments, chiefly from New York (Long Island and elsewhere), New Jersey, and South Carolina, constituted 92 percent of all unloads. Only 8 percent arrived by rail. Nearly 70 percent of the rail unloads were from the States covered by the present inspections.

Inspections were made on 278 carlots, or 37 percent of all rail unloads. Distribution of decay within them was as follows:

Decay class (percent):	Carlots in indicated decay class		Decay class (percent)—	Carlots in indicated decay class	
	Number	Percent		Number	Percent
0.....	259	93.1	Continued		
Trace-4.....	6	2.2	30-34.....	2	0.7
5-9.....	3	1.1	35-39.....	0	0
10-14.....	2	.7	40-44.....	2	.7
15-19.....	1	.4	45-49.....	0	0
20-24.....	1	.4	50-54.....	1	.4
25-29.....	1	.4			



Decay, averaging 16.4 percent per carlot showing decay, was found in 19 carlots, or 7 percent of those inspected. The decay in all instances was bacterial soft rot.

A summary of all radish inspections is given in table 35. Decay per carlot inspected ranged from 0 to 4 percent and averaged 1.1 percent for the entire period. The most decay was found in Texas shipments and the least in those from Virginia.

TABLE 35.—*Summary of radish inspections, 1935-42*

## ANALYSIS BY YEARS

Year or State	Carlots inspected		Percentage of carlots inspected showing decay	Average decay <sup>1</sup> per carlot inspected
	Percentage of New York City rail unloads	Total		
	Percent	Number	Percent	Percent
1935.....	22	8	0	0
1936.....	41	69	6	.6
1937.....	41	55	7	1.2
1938.....	32	34	12	2.7
1939.....	46	38	0	0
1940.....	37	38	11	1.5
1941.....	21	11	18	4.0
1942.....	39	25	4	.6
Total.....	37	278	7	1.1

## ANALYSIS BY STATES

Florida.....	48	37	5	1.3
Texas.....	75	100	12	2.4
Virginia.....	34	99	1	Trace
Unknown.....		42	10	.6
Total.....		278	7	1.1

<sup>1</sup> All bacterial soft rot caused by *Erwinia carotovora*.

## RHUBARB

Over 3,600 carlots of rhubarb were unloaded during the 7-year period. Rail shipments comprised 28 percent of all unloads. Practically all rail shipments were received from the States covered by the present inspections. Truck shipments, chiefly from New York (Long Island and elsewhere), New Jersey, and Pennsylvania, constituted 72 percent of the unloads.

Inspections were made on 247 carlots, or 25 percent of all rail unloads. Distribution of decay within them was as follows:

Decay class (percent):	Carlots in indicated decay class		Decay class (percent)—	Carlots in indicated decay class	
	Number	Percent		Number	Percent
0.....	166	67.2	Continued		
Trace-4.....	39	15.8	35-39.....	2	0.8
5-9.....	15	6.1	40-44.....	2	.8
10-14.....	9	3.6	45-49.....	1	.4
15-19.....	3	1.2	50-54.....	3	1.2
20-24.....	2	.8	55-59.....	1	.4
25-29.....	1	.4	60-64.....	1	.4
30-34.....	2	.8			

Decay, averaging 11.2 percent per carlot showing decay, was found in 81 carlots, or 33 percent of those inspected. Distribution of decay by types was as follows:

Kind of decay:	Distribution		Kind of decay—Con.	Distribution	
	Carlots (number)	Average per carlot (percent)		Carlots (number)	Average per carlot (percent)
Bacterial soft rot---	54	11.1	Watery soft rot-----	16	7.0
Gray mold rot-----	13	11.8	Other decay-----	7	6.3

A summary of all rhubarb inspections is given in table 36. Decay per carlot inspected averaged 3.7 percent for the entire period, with the least (0) in 1935 and the most (6.1 percent) in 1936. Nearly two-thirds of the decay was bacterial soft rot. The most decay occurred in shipments from Michigan.

TABLE 36.—Summary of rhubarb inspections, 1935-42

ANALYSIS BY YEARS

Year or State	Carlots inspected		Percentage of carlots inspected showing decay	Average decay per carlot inspected				
	Percentage of New York City rail unloads	Total		Total of decays	Watery soft rot <sup>1</sup>	Bacterial soft rot <sup>2</sup>	Gray mold rot <sup>3</sup>	Other decay
1935.....	78	14	0	0	0	0	0	0
1936.....	33	41	46	6.1	.8	4.2	.1	1.0
1937.....	15	19	32	3.7	.4	3.3	0	0
1938.....	12	10	50	4.5	.3	4.0	.2	0
1939.....	19	26	35	5.4	2.0	1.6	1.8	0
1940.....	30	59	22	1.9	Trace	1.9	Trace	0
1941.....	35	67	37	3.8	.3	2.5	1.0	Trace
1942.....	10	11	36	3.3	0	0	3.3	0
Total.....	25	247	33	3.7	.5	2.4	.6	.2

ANALYSIS BY STATES

California.....	66	192	24	3.2	0.6	2.0	0.6	Trace
Michigan.....	5	28	75	6.4	0	5.6	.8	0
Washington.....	12	11	55	3.2	.1	3.1	0	0
Unknown.....		16	44	4.8	.3	1.7	.2	2.6
Total.....		247	33	3.7	.5	2.4	.6	.2

<sup>1</sup> Caused by *Sclerotinia* spp.

<sup>2</sup> Caused by *Erwinia carotovora*.

<sup>3</sup> Caused by *Botrytis* spp.

SHALLOTS

Approximately 900 carlots of shallots were unloaded during the 7-year period. All were rail shipments from Louisiana.

Inspections were made during 1936 and 1939-42 on 131 carlots. These represented 17 percent of unloads for those years, or 15 percent of all rail unloads for the entire 7-year period.

An average of 16.5 $\frac{1}{2}$  percent bacterial soft rot of tops was found in two carlots, or 1.5 percent of those inspected. Decay per carlot inspected thus averaged 0.3 percent.

## SPINACH

Approximately 35,000 carlots of spinach were unloaded during the 7-year period. Thirty-nine percent were rail shipments, practically all of which originated in the States covered by the present inspections. Truck shipments, chiefly from New York (Long Island and elsewhere), New Jersey, Pennsylvania, and Virginia, constituted 61 percent of all unloads.

Inspections were made on 5,018 carlots, or 37 percent of all rail unloads. Distribution of decay<sup>22</sup> within them was as follows:

Decay class (percent):	Carlots in indicated decay class		Decay class (percent)—	Carlots in indicated decay class	
	Number	Percent		Number	Percent
0-----	2,916	58.1	Continued		
Trace-4-----	258	5.1	50-54-----	30	0.6
5-9-----	542	10.8	55-59-----	17	.3
10-14-----	366	7.3	60-64-----	20	.4
15-19-----	216	4.3	65-69-----	10	.2
20-24-----	179	3.6	70-74-----	6	.1
25-29-----	154	3.1	75-79-----	6	.1
30-34-----	116	2.3	80-84-----	3	.1
35-39-----	80	1.6	85-89-----	5	.1
40-44-----	50	1.0	90-94-----	4	.1
45-49-----	40	.8			

Decay, averaging 17.3 percent per carlot showing decay, was found in 2,102 carlots, or 42 percent of those inspected. The distribution of decay by types was as follows:

Kind of decay:	Distribution		Kind of decay—Con.	Distribution	
	Carlots (number)	Average per carlot (percent)		Carlots (number)	Average per carlot (percent)
Downy mildew----	1,625	17.5	Bacterial soft rot--	517	5.6
White rust-----	373	13.4	Other decay-----	4	13.0

A summary of all spinach inspections is found in table 37. Decay per carlot inspected ranged in amount from 0.9 to 12.7 percent, with an average of 7.3 percent for the entire period. Downy mildew was of chief importance (5.7 percent); white rust (1.0 percent) and bacterial soft rot (0.6 percent) were found in smaller amounts. In the analysis by States it will be noted that most of the carlots originated in Texas but that nearly 500 carlots came from Virginia. White rust was reported only from Texas. Downy mildew was much less important in carlots from Virginia than in those from Texas. Decay per carlot inspected was 8.0 percent in shipments from Texas and 3.9 percent in those from Virginia.

<sup>22</sup> Downy mildew and white rust included with decay.

TABLE 37.—Summary of spinach inspections, 1935-42

## ANALYSIS BY YEARS

Year or State	Carlots inspected		Percent- age of carlots inspected showing decay	Average decay <sup>1</sup> per carlot inspected				
	Percent- age of New York City rail unloads	Total		Total of decays	Downy mildew <sup>2</sup>	White rust <sup>3</sup>	Bac- terial soft rot <sup>4</sup>	Other decay
	<i>Percent</i>	<i>Number</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>
1935.....	56	323	9	0.9	0.7	0	0.2	0
1936.....	51	1,153	57	12.7	11.9	0	.8	Trace
1937.....	27	642	70	9.2	7.2	1.5	.5	0
1938.....	30	692	48	11.1	7.5	2.7	.9	0
1939.....	36	687	22	2.0	1.3	.5	.2	Trace
1940.....	56	641	11	1.2	.4	.1	.7	Trace
1941.....	31	501	49	7.6	4.0	2.9	.7	0
1942.....	28	379	44	5.5	4.2	1.1	.2	0
Total.....	37	5,018	42	7.3	5.7	1.0	.6	Trace

## ANALYSIS BY STATES

Arkansas.....	27	14	50	8.3	0	0	8.3	0
Colorado.....	77	86	8	1.0	.6	0	.4	0
Texas.....	33	3,104	47	8.0	6.0	1.6	.4	Trace
Virginia.....	14	494	27	3.9	3.0	0	.9	0
Washington.....	100	9	11	.1	0	0	.1	0
Unknown.....		1,311	37	7.3	6.4	Trace	.9	Trace
Total.....		5,018	42	7.3	5.7	1.0	.6	Trace

<sup>1</sup> Downy mildew and white rust included with decay.<sup>2</sup> Caused by *Peronospora spinaciae*.<sup>3</sup> Caused by *Albugo occidentalis*.<sup>4</sup> Caused by *Erwinia carotovora*.

## SWEETPOTATOES

Approximately 8,600 carlots of sweetpotatoes were unloaded during 1935-38, the years in which inspections were made. Eighty-seven percent of the unloads were truck shipments; 13 percent were rail shipments. Inspections were made on 38 carlots, or 3 percent of all rail unloads.

State of origin was indicated for only 5 carlots inspected: namely, Florida 1, North Carolina 2, and Virginia 2. Decay, averaging 4.3 percent, was found in 16 carlots, or 42 percent of those inspected. Decay per carlot inspected averaged 1.7 percent of rhizopus rot and 0.1 percent of black rot, caused by *Ceratostomella fimbriata*—a total of 1.8 percent.

## TOMATOES

Nearly 53,500 carlots of domestic tomatoes were unloaded during the 7-year period. Half of them were rail shipments, practically all of which originated in the States covered by the present inspections.

Nearly half were truck shipments from a number of States, of which New Jersey and New York were by far the most important; a few were boat shipments.

Inspections were made on 10,218 carlots, or 38 percent of all rail unloads. Distribution of decay<sup>23</sup> within them was as follows:

Decay class (percent):	Carlots in indicated decay class		Decay class (percent)—	Carlots in indicated decay class	
	Number	Percent		Number	Percent
0-----	1,945	19.0	Continued		
Trace-4-----	6,200	60.7	45-49-----	4	Trace
5-9-----	1,523	14.9	50-54-----	5	Trace
10-14-----	339	3.3	55-59-----	1	Trace
15-19-----	102	1.0	60-64-----	2	Trace
20-24-----	47	.5	65-69-----	2	Trace
25-29-----	19	.2	70-74-----	0	0
30-34-----	17	.2	75-79-----	1	Trace
35-39-----	7	.1	80-84-----	1	Trace
40-44-----	3	Trace			

Decay, averaging 3.8 percent per carlot showing decay, was found in 8,273 carlots, or 81 percent of those inspected. Distribution of decay by types was as follows:

Kind of decay:	Distribution		Kind of decay—Con.	Distribution	
	Carlots (number)	Average per carlot (percent)		Carlots (number)	Average per carlot (percent)
Bacterial soft rot---	6,342	2.8	Cladosporium rot---	239	3.9
Rhizopus rot-----	1,457	2.2	Pleospora rot-----	231	3.1
Alternaria rot-----	755	3.1	Blossom-end rot-----	301	1.9
Late blight rot-----	658	2.2	Buckeye rot-----	41	3.0
Phoma rot-----	507	2.4	Fusarium rot-----	32	2.5
Soil rot-----	576	2.0	Other decay-----	485	1.5
Virus mottling-----	175	6.1			

The results of all tomato inspections are summarized in table 38. Decay per carlot inspected ranged from 2.3 to 3.4 percent and averaged 2.9 percent for the entire period. Somewhat less than two-thirds of the decay was due to bacterial soft rot. Rhizopus rot and alternaria rot were next in importance.

About 85 percent of all carlots inspected were from California, Florida, and Texas. When these three States are considered, decay was lowest in carlots from Florida and highest in those from California. Pleospora rot was found only in shipments from California; most of the virus mottling was reported in shipments from California.

<sup>23</sup> Virus mottling included with decay.

TABLE 38.—Summary of tomato inspections, 1935-42

## ANALYSIS BY YEARS

Year or State	Carlots inspected		Percentage of carlots of New York City rail unloads	Percentage of carlots inspected showing decay	Average decay <sup>1</sup> per carlot inspected												
	Percent	Number			Total of decays	Bacterial soft rot <sup>2</sup>	Rhizopus rot <sup>3</sup>	Alternaria rot <sup>4</sup>	Late blight rot <sup>5</sup>	Phoma rot <sup>6</sup>	Soil rot <sup>7</sup>	Virus mottling	Cladosporium rot <sup>8</sup>	Pleospora rot <sup>9</sup>	Blossom-end rot	Buckeye rot <sup>10</sup>	Fusarium rot <sup>11</sup>
1935	41	519	65	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent
1936	43	1,480	83	0.8	0.7	0.2	0.2	0.1	0.2	Trace	0.1	Trace	Trace	Trace	Trace	Trace	Trace
1937	42	1,583	81	2.0	4	1.1	1.1	1.1	2.2	0.1	0.3	0.1	Trace	Trace	Trace	Trace	Trace
1938	40	2,074	78	1.8	4	1.1	2.2	2.2	1.1	0.1	0.1	Trace	Trace	Trace	Trace	Trace	Trace
1939	35	1,487	79	1.3	5	1.1	Trace	Trace	2.2	0.1	Trace	Trace	Trace	Trace	Trace	Trace	Trace
1940	33	1,090	78	2.3	2	2.2	2.2	1.1	1.1	Trace	Trace	Trace	Trace	Trace	Trace	Trace	Trace
1941	33	1,086	85	1.3	2	3	3	1.1	1.1	Trace	Trace	Trace	Trace	Trace	Trace	Trace	Trace
1942	34	1,919	98	1.6	2	2	2	1.1	1.1	Trace	Trace	Trace	Trace	Trace	Trace	Trace	Trace
Total	38	10,218	81	2.4	3	2	2	1	1	1	1	1	Trace	Trace	Trace	Trace	Trace

## ANALYSIS BY STATES

Year or State	Carlots inspected		Percentage of carlots of New York City rail unloads	Percentage of carlots inspected showing decay	Average decay <sup>1</sup> per carlot inspected												
	Percent	Number			Total of decays	Bacterial soft rot <sup>2</sup>	Rhizopus rot <sup>3</sup>	Alternaria rot <sup>4</sup>	Late blight rot <sup>5</sup>	Phoma rot <sup>6</sup>	Soil rot <sup>7</sup>	Virus mottling	Cladosporium rot <sup>8</sup>	Pleospora rot <sup>9</sup>	Blossom-end rot	Buckeye rot <sup>10</sup>	Fusarium rot <sup>11</sup>
Arkansas	95	158	86	2.2	0.3	0.1	0.1	Trace	0.1	0.1	0	Trace	Trace	Trace	Trace	Trace	Trace
California	60	3,044	73	3.2	6	5	2	0	0.2	1.1	0	Trace	Trace	Trace	Trace	Trace	Trace
Florida	29	3,011	80	2.6	1	1	Trace	0.2	1.5	2	0	Trace	Trace	Trace	Trace	Trace	Trace
Georgia	12	32	100	6.3	3	6	4	3	8	2	0	0	0	0	0	0	0
Illinois	54	33	100	6.3	3	3	3	3	8	2	0	0	0	0	0	0	0
Louisiana	15	369	96	5.8	5	1	1	2	6	3	0	0	0	0	0	0	0
Mississippi	35	117	96	1.6	1	4	0	1	0	3	0	0	0	0	0	0	0
New York	12	15	87	2.5	7	0	1	0	0	1	0	0	0	0	0	0	0
North Carolina	8	15	86	2.8	1	2	2	Trace	3	3	0	0	0	0	0	0	0
South Carolina	26	411	88	3.4	5	1	1	1	1	1	0	Trace	Trace	Trace	Trace	Trace	Trace
Tennessee	26	230	88	2.4	3	1	1	Trace	1	1	Trace	Trace	Trace	Trace	Trace	Trace	Trace
Texas	47	2,674	89	3.0	3	1	2	0	0	1	0	0	0	0	0	0	0
Utah	40	10	70	1.9	7	0	0	Trace	1	1	Trace	Trace	Trace	Trace	Trace	Trace	Trace
Unknown	47	114	76	2.7	3	2	2	Trace	1	1	Trace	Trace	Trace	Trace	Trace	Trace	Trace
Total	38	10,218	81	2.9	3	2	2	1	1	1	1	1	Trace	Trace	Trace	Trace	Trace

1 Virus mottling included with decay.

2 Caused by *Rhizoctonia solani*.3 Caused by *Alternaria* spp.4 Caused by *Rhizopus* spp.5 Caused by *Pleospora herbarum*.6 Caused by *Phytophthora* spp.7 Caused by *Phytophthora infestans*.8 Caused by *Phoma destructiva*.9 Caused by *Phoma destructiva*.10 Caused by *Phoma destructiva*.11 Caused by *Phoma destructiva*.

## DISCUSSION

Nearly 1½ million carlots of fresh fruits and vegetables were unloaded at the New York City market during the 7-year period under study; approximately 48 percent of the total unloads were rail shipments. Rail unloads at New York City in turn accounted for approximately 15 percent of all fresh fruits and vegetables that were shipped by rail to markets throughout the United States during the period.

The present summary covers the inspection of 117,613 carlots, or approximately 16 percent of all rail unloads; however, because there was some lack of uniformity in extent of coverage for the different commodities a number of different fruits and vegetables were not represented in the inspections. The more important of these were bananas, lemons, pineapples, dandelions, eggplants, kale, mushrooms, parsnips, squashes, Swiss chard, turnips (including rutabagas), and watermelons. In table 39 there is shown for each of these commodities the total number of carlots unloaded during the 7-year period and the percentage of the latter that were rail shipments. In addition 16 other fruits and 36 other vegetables listed in the annual reports of unloads at New York City were not represented by inspections. Most of them were distinctly of minor importance, and together they totaled less than 2 percent of all unloads for the 7-year period.

TABLE 39.—*Important commodities not included in present study*

Commodity	Carlots unloaded at New York City during the 7-year period		Commodity	Carlots unloaded at New York City during the 7-year period	
	Total	Percentage that were rail shipments		Total	Percentage that were rail shipments
<b>Fruits:</b>	<i>Number</i>	<i>Percent</i>	<b>Vegetables—Continued</b>	<i>Number</i>	<i>Percent</i>
Bananas <sup>1</sup> .....	81,549	Trace	Mushrooms.....	8,232	15
Lemons.....	20,329	92	Parsnips.....	3,169	18
Pineapples.....	16,714	Trace	Squashes.....	5,945	9
Mixed fruits <sup>2</sup> .....	12,693	99.7	Swiss chard.....	2,768	0
<b>Vegetables:</b>			Turnips (and rutabagas).....	9,259	46
Dandelions.....	3,627	2	Watermelons.....	16,018	84
Eggplants.....	6,826	3	Mixed vegetables <sup>2</sup> .....	26,497	98
Kale.....	6,011	11			

<sup>1</sup> Only bananas sold in New York City included; 181,966 carlots were unloaded.

<sup>2</sup> Practically all of the carlots of mixed fruits and of mixed vegetables were made up of commodities that are represented by inspections.

Of those commodities that were included in the present study, 14 were fruits and 31 were vegetables, or 45 different commodities. For purposes of ready comparison all are listed in table 40, together with data on total carlots inspected (both in number and in percentage of all rail unloads of that commodity) and with data on average percentage of decay reported.

A total of 16,520 inspections was made on fruits. The percentage of rail shipments inspected ranged from 1 percent for oranges to 55 percent for pomegranates. Average coverage of rail shipments was 14.3 percent.

Average decay of fruits was lowest (0.6 percent) in nectarines and highest (4.5 percent) in figs. Most of the figures were well within a much narrower range and the average for all 14 fruits was 2.1 percent.

A total of 101,093 inspections was made on vegetables. Although over 2,500 carlots of potatoes, the most important commodity, were inspected, they represent only 3 percent of the rail unloads of that commodity. Likewise for onions and cucumbers the percentage of rail unloads inspected was low. The same was true for sweetpotatoes, for which rail shipments were not of great importance. The percentage of rail shipments inspected of other vegetables was for the most part very high, ranging from 23 to 78 percent for 23 commodities. The average inspection coverage for all 31 vegetables was 36.1 percent of rail shipments.

TABLE 40.—Summary of statistics on inspections of various commodities, 1935-42

Commodity	Carlots inspected		Average decay per carlot	Commodity	Carlots inspected		Average decay per carlot
	Percentage of rail unloads	Total inspected			Percentage of rail unloads	Total inspected	
Fruits:	<i>Percent</i>	<i>Number</i>	<i>Percent</i>	Vegetables—Continued	<i>Percent</i>	<i>Number</i>	<i>Percent</i>
Apples.....	13	3,265	2.9	Cabbage.....	23	4,597	8.2
Apricots.....	13	182	.8	Carrots.....	54	12,344	1.6
Cherries.....	20	801	2.4	Cauliflower.....	57	4,596	.7
Figs.....	9	18	4.5	Celery.....	20	4,757	6.6
Grapefruit.....	6	1,157	1.2	Corn (green).....	35	344	.1
Grapes.....	7	3,271	3.4	Cucumbers.....	5	414	2.0
Nectarines.....	10	78	.6	Endive (chicory).....	62	607	11.7
Oranges.....	1	1,034	1.1	Escarole.....	9	322	8.4
Peaches.....	11	2,258	1.9	Lettuce.....	52	24,737	11.5
Pears.....	7	1,405	2.5	Muskmelons:			
Plums (and fresh prunes).....	17	1,974	1.8	Cantaloups.....	36	3,294	6.7
Pomegranates.....	55	97	.7	Honey Dew melons.....	55	4,181	2.2
Strawberries.....	24	913	2.4	Honey Ball and mixed melons.....	63	2,415	4.3
Tangerines.....	7	67	2.5	Onions.....	4	856	5.0
Average <sup>1</sup> or total.....	14.3	16,520	2.1	Parsley.....	76	816	2.3
Vegetables:				Peas.....	53	8,676	.9
"Anise" (finocchio).....	47	377	9.2	Peppers.....	23	659	3.6
Artichokes (globe).....	23	430	6.4	Potatoes.....	3	2,534	1.0
Asparagus.....	31	1,252	2.8	Radishes.....	37	278	1.1
Beans (lima).....	36	183	.9	Rhubarb.....	25	247	3.7
Beans (snap).....	16	2,175	.5	Shallots.....	17	131	.3
Beets.....	55	1,689	1.2	Spinach.....	37	5,018	7.3
Broccoli.....	46	2,445	1.2	Sweetpotatoes.....	3	38	1.8
Brussels sprouts.....	78	463	1.5	Tomatoes.....	38	10,218	2.9
				Average <sup>1</sup> or total.....	36.1	101,093	3.8

<sup>1</sup> Not weighted.

Average decay in vegetable commodities was lowest in corn (0.1 percent) and highest in endive (11.7 percent), with an average of 3.8 percent for all. Thus, it will be seen that the average decay was nearly twice as much in vegetables as in fruits. However, in many vegetables—particularly the leafy ones, which are normally trimmed somewhat—the presence of decay is not always very important from a commercial, or sales, angle. Likewise, decay that affects parts of the vegetable that are not consumed—such, for example, as leaves of cauliflower, wrapper leaves of cabbage, or tops of carrots—may not reduce the edible portion or the quality of the vegetable, particularly



if the decay is in early stages. However, the exact point at which any given decay reported on a certificate becomes of marked commercial importance is of course impossible to determine. Actually the presence of enough decay to warrant recording on the certificate would detract to some extent at least from the consumer appeal of any fruit or vegetable. This, in turn, would be reflected by either a reduced sales price or the inability to sell at any price. It would appear, therefore, that the policy adopted in the present circular of considering all evidences of decay as indication of spoilage is fully justified.

By examining more closely the data on decay in table 40 it can be determined (by multiplying the number of carlots inspected for each commodity by the average decay recorded) that in all the carlots of fruits inspected decay totaled 391 carlots. Similarly for the vegetables inspected decay totaled 5,320 carlots. Of all decay reported on the fruits inspected, 30 percent was due to blue mold rot, 25 percent to gray mold rot, 15 percent to rhizopus rot, and 3 percent to cladosporium rot. The other 27 percent of fruit spoilage was caused by 5 other types of decay and 4 nonparasitic types of defects. Of all spoilage reported for vegetables, 36 percent was due to bacterial soft rot, 3 percent to watery soft rot, 2 percent to rhizopus rot, and 1 percent to gray mold rot. The other 58 percent of vegetable spoilage was caused by 27 other decays and 5 nonparasitic troubles.

Two significant facts have already been pointed out: (1) That the number of carlots inspected represented a high percentage of all rail unloads and (2) that the carlots inspected were equally representative of carlots in good and bad condition. Therefore, it appears to be a fair assumption that decay in the carlots not inspected was as great as in those that were inspected. By applying the figures on percentage decay for each commodity to all rail carlots of that commodity unloaded at New York City during the 7-year period, it was calculated that decay in all rail shipments of the 14 fruits totaled 4,936 carlots and decay of the 31 vegetables totaled 15,689 carlots, or a grand total of 20,625 carlots. These figures apply only to the 45 commodities included in the present study. They do not take into consideration the decay that occurred in truck or boat shipments. On the basis of the figures given, decay of the 45 commodities during transit in rail shipments to New York City totaled annually nearly 3,000 carlots.

## SUMMARY

A summary was made of the decay recorded on 117,613 inspection certificates issued at New York City by the Fruit and Vegetable Branch, Production and Marketing Administration, United States Department of Agriculture, during the 7-year period from July 1, 1935, to August 1, 1942. The certificates dealt only with carlot rail unloads. With certain specified exceptions the carlots inspected were representative of all rail unloads during that period.

The certificates covered the inspection of 14 fruits and 31 vegetables. An average of 14.3 percent of rail unloads of fruits and of 36.1 percent of vegetables were inspected. All important fresh fruits and vegetables except bananas, lemons, pineapples, dandelions,

eggplants, kale, mushrooms, parsnips, squashes, Swiss chard, turnips (including rutabagas), and watermelons were included.

For each of the 45 commodities information is given in the text on total unloads for the period and on the relative importance of rail shipments. Some information is presented on distribution of decay by amounts reported per carlot. For each kind of decay affecting a given commodity the number of carlots so affected and the average percentage of decay present are also given.

For most commodities the data on decay are broken down in tabular form by year of unloading and State of origin and in many instances by month of unloading. Decay is recorded for each type in percentage per carlot inspected. In each commodity table there are also given the number of carlots inspected, the percentage of total rail unloads which they represent, and the percentage of carlots inspected that showed decay.

The average of decay per carlot inspected was 2.1 percent for the 14 fruit commodities and 3.8 percent for the 31 vegetable ones. For all carlots of fruits and vegetables inspected during the 7-year period decay totaled 5,711 carlots; 30 percent of all fruit decay was caused by blue mold rot and 36 percent of all vegetable decay by bacterial soft rot.

By assuming that decay occurred in the carlots not inspected to the same extent as in those inspected, it was estimated that for the period under study decay of these 45 commodities during rail transit to New York City totaled nearly 3,000 carlots annually.







