

Disorders in Cucumber, Squash, and Watermelon Shipments to the New York Market, 1972-1985

R. A. CAPPELLINI, Professor of Plant Pathology, Rutgers University, New Brunswick, NJ 08903; M. J. CEPONIS, Research Plant Pathologist, Agricultural Research Service, U.S. Department of Agriculture, New Brunswick, NJ 08903; and G. W. LIGHTNER, Computer Specialist, U.S. Department of Agriculture, Appalachian Fruit Research Station, Kearneysville, WV 25430

Cucumber (*Cucumis sativus* L.) and watermelon (*Citrullus vulgaris* Schrad.) are popular fresh produce crops consumed in salads or "eating-out-of-hand" and rank in the top 10 vegetables delivered to the New York City market (15,16). Consumption of squash (*Cucurbita* spp.) has doubled in the last 10 years (Table 1), and squash is now popularly used in salads or as a cooked dish.

This report is a continuation of a series (1-13) based on computerization of USDA inspection data on shipments of major produce crops on arrival at New York City terminal markets. Inspections are generally requested when shippers or receivers question the quality of produce at arrival. USDA personnel inspected 5,287 shipments of cucurbits during 1972-1985. Information derived from these inspections should be useful in improving quality and reducing market losses of cucumbers, squash, and watermelons.

Cucumbers. During 1972-1985, USDA personnel inspected 3,060 shipments of cucumbers, representing about 5% of the 577,000 t delivered to New York markets (Tables 1 and 2). Thirteen parasitic diseases, eight physiological disorders, and seven types of injury were reported (Table 3). Parasitic diseases accounted for 43%, physiological disorders for 49%, and injuries for 8% of the 6,592 occurrences, which averaged 2.2 per shipment.

The soft rots were the most destructive diseases, dominated by cottony leak (*Pythium aphanidermatum*), followed by bacterial soft rot (*Erwinia* and *Pseudomonas* spp.) (Table 3). Cottony leak was detected in 58.4% of shipments and was distributed throughout all incidence classes, with 559 shipments having 11 to >50% of the contents rotted; characteristically, this disease spreads by contact and forms nests of decay. Although noted less frequently (11.2% of shipments), bacterial soft rot was also distributed throughout all incidence classes. A substantial number of decays were unidentified (12.1%) but most were in the 1-5% incidence class. Federal inspectors often do not name a disease when the grade tolerance is met or when the characteristic symptoms are not fully developed or recognized. Black rot (*Mycosphaerella citrullina*), an important disease of cucumber whose early symptoms can be easily mistaken for other diseases, was detected in 5.2% of shipments. Diseases of lesser importance were anthracnose (*Colletotrichum lagenarium*), gray mold rot (*Botrytis cinerea*), watery soft rot (*Sclerotinia sclerotiorum*), Alternaria rot (*Alternaria* sp.), and Fusarium rot (*Fusarium* sp.). Mosaic (cucumber mosaic virus), soil rot (*Pellicularia filamentosa*), bacterial spot (*Pseudomonas lachrymans*), and scab (*Cladosporium cucumerinum*) were reported infrequently.

Yellowing and shriveling were the most frequently reported nonparasitic disorders and were distributed throughout all incidence classes (Table 3). Sunken areas of indeterminate size were reported in 10.7% of shipments and in most cases were probably due to exposure to low temperatures, although chilling damage was reported specifically in 1.1% of shipments. Freeze damage was reported infrequently (2.4% of shipments) but caused extensive damage.

Mexico and Florida are the principal suppliers of cucumbers to the New York markets, particularly during the winter and spring months. The percentage of occurrences and the distribution throughout incidence classes of cottony leak, bacterial soft rot, and unidentified decays in shipments from both sources were very similar (Tables 4 and 5). Black rot, the other disease of note, was reported more frequently in Florida shipments than in those from Mexico. The remaining diseases were similarly profiled and, with the exception of gray mold rot (Mexico and Florida shipments) and anthracnose and Alternaria rot (Florida shipments), occurred in less than 1% of the shipments.

Squash. During 1972-1985, USDA personnel inspected 1,332 shipments of squash, representing about 3% of the 188,182 t delivered to New York markets (Tables 1 and 2). Sixteen parasitic diseases (1,199 occurrences), eight physiological disorders (352 occurrences), and eight types of injury (218 occurrences) were identified or described (Table 6).

Bacterial soft rot (*Erwinia* and *Pseudomonas* spp.) was found in 736 shipments and accounted for 61% of all disease occurrences. Considering a 2% tolerance for this disease, at least 81% of the shipments failed to meet U.S. No. 1 grade standards. Shipments with more than one-third of the squash rotted were probably complete losses. Other damaging diseases were cottony leak, gray mold rot, and Rhizopus rot (*Rhizopus* sp.), with most occurrences in the 11 to >50% incidence classes. Black rot and Alternaria rot were similarly distributed but occurred in fewer shipments. Unidentified decays occurred in substantial numbers, nearly all in the lowest incidence class. Blossom-end rot (*Choanephora cucurbitarum*), Phytophthora rot (*Phytophthora* sp.), Fusarium rot, anthracnose, and Cladosporium rot (*C. cucumerinum*) all were identified in less than 1% of shipments (Table 6).

Table 1. Volume of cucumbers, squash, and watermelons shipped to the New York market, 1972-1985

Year	Number of 45,400-kg units		
	Cucumbers	Squash	Watermelons
1972	908	171	1,107
1973	954	207	1,450
1974	995	202	1,397
1975	1,008	209	1,364
1976	1,035	197	1,285
1977	1,044	205	1,434
1978	778	280	790
1979	810	251	480
1980	806	410	971
1981	1,026	389	1,265
1982	953	395	1,058
1983	933	403	1,087
1984	812	399	1,111
1985	636	422	813
Total	12,698	4,140	15,612

Table 2. Cucumber, squash, and watermelon shipments inspected by the USDA on the New York market, 1972–1985

Year	Cucumbers		Squash		Watermelons	
	Shipments (no.)	Packs ^a (no.)	Shipments (no.)	Packs ^b (no.)	Shipments (no.)	Packs ^c (no.)
1972	249	105,897	55	16,117	77	96,279
1973	342	143,851	43	8,255	73	74,629
1974	165	84,713	48	12,202	71	68,750
1975	152	58,964	69	11,191	52	60,421
1976	156	73,923	99	21,756	151	179,627
1977	164	61,045	51	8,537	67	108,292
1978	120	64,944	49	9,339
1979	80	42,379	20	4,458	39	34,637
1980	128	51,386	47	9,889	45	40,481
1981	173	50,457	97	22,209	28	19,923
1982	229	78,448	105	23,663	56	44,642
1983	362	132,737	198	46,970	61	75,096
1984	414	166,039	330	91,439	75	70,378
1985	326	135,185	121	43,341	100	38,924
Total	3,060	1,249,968	1,332	329,366	895	912,079

^a Bushel, carton, or crate with net weight of 25 kg.^b Summer squash, 0.5-bushel carton or crate with net weight of 9.5 or 11.8 kg; winter squash, carton with net weight of 22.7 kg.^c Carton with net weight of 34 kg.**Table 3.** Frequency of disorders reported in USDA inspections of 3,060 cucumber shipments^a on the New York market, 1972–1985

Disorder	Shipments affected (%)	Number of shipments affected according to incidence class (% fruit)						
		0	1–5	6–10	11–20	21–33	34–50	>50
Cottony leak	58.4	1,273	639	589	341	117	50	51
Yellowing	47.5	1,607	417	484	408	113	25	6
Shriveling	33.9	2,024	498	295	178	54	8	3
Unidentified decays	12.1	2,689	355	10	6	0	0	0
Bacterial soft rot	11.2	2,717	157	110	39	24	7	6
Sunken areas	10.7	2,733	183	106	31	5	1	1
Grade defects ^b	10.1	2,751	153	122	21	9	1	3
Soft fruit	9.9	2,757	142	99	52	7	2	1
Black rot	5.2	2,901	67	57	31	3	0	1
Freeze damage	2.4	2,986	3	10	24	12	3	22
Bruise damage	2.3	2,991	55	10	3	1	0	0
Anthraxnose	1.7	3,007	22	14	6	10	1	0
Scarring	1.5	3,013	38	7	2	0	0	0
Gray mold rot	1.4	3,017	18	9	9	5	1	1
Misshapen fruit	1.3	3,020	31	8	0	1	0	0
Chilling damage	1.1	3,027	15	10	5	3	0	0
Sunken discoloration	1.0	3,028	15	14	3	0	0	0
Watery soft rot	0.9	3,032	15	10	2	1	0	0
Alternaria rot	0.8	3,036	13	6	1	0	3	1
Fusarium rot	0.7	3,039	14	5	1	1	0	0
Cracking	0.5	3,044	14	2	0	0	0	0
Insect damage	0.3	3,050	10	0	0	0	0	0
Mosaic	0.1	3,056	0	1	3	0	0	0
Rhizopus rot	0.1	3,056	0	1	1	1	1	0
Soil rot	0.1	3,057	2	1	0	0	0	0
Bacterial spot	0.1	3,057	2	1	0	0	0	0
Scab	0.1	3,058	1	1	0	0	0	0
Sunburn	<0.1	3,059	1	0	0	0	0	0
Russetting	<0.1	3,059	1	0	0	0	0	0

^a From 19 states, Puerto Rico, and 10 foreign countries.^b Minor scars, bruises, mechanical damage, and unidentified defects.

Soft fruit and bruise damage were the most frequently reported physiological disorder and injury, respectively (Table 6). Shriveling was reported in a considerable number of shipments, mostly in the lower incidence classes. Chilling damage was reported infrequently but some instances may have been reported as sunken areas or sunken discoloration. Freeze damage was extensive in some shipments. Of the remaining

nonparasitic disorders, grade defects were most common.

Approximately 85% of the squash shipments inspected were from Florida and Mexico. Cottony leak and gray mold rot were reported more often, and bacterial soft rot less often, in shipments from Mexico than in those from Florida (Table 7). Rhizopus rot was noted with almost equal frequency. Disease profiles of zucchini and yellow squash were similar overall,

Table 4. Frequency of parasitic diseases reported in USDA inspections of 1,260 Mexico cucumber shipments on the New York market, 1972–1985

Disorder	Shipments affected (%)	Number of shipments affected according to incidence class (% fruit)						
		0	1–5	6–10	11–20	21–33	34–50	>50
Cottony leak	57.3	538	262	273	121	33	18	15
Unidentified decays	13.4	1,091	160	6	3	0	0	0
Bacterial soft rot	11.1	1,120	62	54	11	5	5	3
Black rot	3.9	1,211	24	19	5	1	0	0
Gray mold rot	1.3	1,243	7	3	5	1	1	0
Anthracoise	0.7	1,251	3	4	2	0	0	0
Watery soft rot	0.6	1,253	3	3	1	0	0	0
Alternaria rot	0.6	1,253	4	2	0	0	1	0
Fusarium rot	0.3	1,256	2	1	1	0	0	0
Mosaic	0.3	1,256	0	1	3	0	0	0
Rhizopus rot	0.2	1,258	0	0	0	1	1	0
Soil rot	0.1	1,259	1	0	0	0	0	0
Scab	0.1	1,259	1	0	0	0	0	0

Table 5. Frequency of parasitic diseases reported in USDA inspections of 974 Florida cucumber shipments on the New York market, 1972–1985

Disorder	Shipments affected (%)	Number of shipments affected according to incidence class (% fruit)						
		0	1–5	6–10	11–20	21–33	34–50	>50
Cottony leak	63.2	358	216	193	130	44	17	16
Bacterial soft rot	11.4	863	58	26	12	13	1	1
Unidentified decays	10.5	872	98	2	2	0	0	0
Black rot	7.5	901	29	27	15	1	0	1
Anthracoise	2.0	955	8	6	1	3	1	0
Gray mold rot	1.8	956	9	4	4	1	0	0
Alternaria rot	1.0	964	6	3	0	0	1	0
Fusarium rot	0.9	965	8	1	0	0	0	0
Watery soft rot	0.9	965	4	5	0	0	0	0
Bacterial spot	0.2	972	1	1	0	0	0	0
Rhizopus rot	0.1	973	0	0	1	0	0	0
Scab	0.1	973	0	1	0	0	0	0

although some variation was noted in specific diseases.

Watermelons. During 1972–1985, USDA personnel inspected 895 shipments of watermelons, representing about 5% of the 709,636 t delivered to New York markets (Tables 1 and 2). Twelve parasitic diseases, eight physiological disorders, and eight types of injury were reported (Table 8). Parasitic diseases accounted for 40%, physiological disorders for 20%, and injuries for 40% of the 1,873 occurrences.

Stem-end rot (*Diplodia natalensis*) was the most frequent and damaging disorder reported (Table 8); 38.5% of shipments were affected, and in approximately one-half of these, more than 10% of the contents were rotted. Anthracnose was reported in 19.8% of shipments and anthracnose rot (decay extending beyond the rind into the pulp) in 4.7%. The distribution of anthracnose in the incidence classes was similar to that of stem-end rot. Another disease of importance was blossom-end rot; although this disease may be induced abiotically, secondary infections are common and make the true cause difficult to determine (14). Of the seven other diseases identified, black rot, bacterial soft rot (*Erwinia* sp.), and Rhizopus soft rot occurred in more than 1% of the shipments; the others occurred less frequently. Unidentified decays were reported in 11.4% of the shipments, but nearly all were in the 1–5% incidence class.

Overripe fruit (18.7%) and soft fruit (10.7%) were the physiological disorders reported most often. Among the remaining six such disorders, misshapen fruit accounted for over one-half of the occurrences.

Bruise damage was reported in 34.5% of the shipments and

was the most damaging nonparasitic disorder. Other kinds of damage included scarring (20%), cracking (4.6%), transit rubs (3.2%), and grade defects (15.3%).

Two-thirds of the inspections were conducted on watermelons shipped from Florida, Texas, and Mexico (Table 9). The percentage of shipments affected by stem-end rot did not differ among sources or between types. Anthracnose and anthracnose rot occurred more frequently in shipments from Florida than in those from Mexico; the reverse was true for Phytophthora rot. In some diseases, differences between melon types were more apparent than differences among sources.

Summary. The results presented in this report are not intended to reflect the arrival condition of all cucurbit shipments to the New York markets, as data are derived from inspections of shipments whose quality was suspect or being questioned. Nonetheless, the examination by trained personnel of 5,287 shipments of cucumbers, squash, and watermelons over a 14-year period provides a fairly accurate profile of the disorders that cause considerable losses in these crops. Every inspection usually involves examination of six packs or more, if needed, to evaluate the quality of the produce. The most damaging disorders on cucumber and watermelon were the field diseases cottony leak and stem-end rot, respectively. Cottony leak also caused considerable damage on squash. Other serious field diseases found on arrival were black rot on cucumber and anthracnose on watermelon. The common occurrence in the market of these field diseases points up the need for improved disease control in the field. Data presented here also underscore the need for improved handling practices

Table 6. Frequency of disorders reported in USDA inspections of 1,332 squash shipments^a on the New York market, 1972-1985

Disorder	Shipments affected (%)	Number of shipments affected according to incidence class (% fruit)						
		0	1-5	6-10	11-20	21-33	34-50	> 50
Bacterial soft rot	55.3	596	140	208	197	116	47	28
Soft fruit	16.0	1,119	45	56	72	23	9	8
Cottony leak	11.9	1,175	15	37	58	31	8	8
Gray mold rot	7.7	1,230	18	26	29	14	9	6
Bruise damage	6.2	1,249	33	24	20	4	1	1
Grade defects ^b	5.9	1,254	54	21	2	1	0	0
Shriveling	5.8	1,255	34	22	14	5	1	1
Unidentified decays	5.0	1,265	63	2	0	2	0	0
Rhizopus rot	5.0	1,266	4	22	17	16	3	4
Freeze damage	2.4	1,300	1	0	9	4	8	10
Sunken areas	2.1	1,304	10	7	8	2	1	0
Sunken discoloration	1.4	1,314	6	3	4	2	3	0
Black rot	1.3	1,315	3	5	2	3	2	2
Alternaria rot	1.2	1,316	2	7	3	2	1	1
Scarring	0.9	1,320	10	2	0	0	0	0
Blossom-end rot	0.7	1,322	1	6	1	1	0	1
Chilling damage	0.6	1,324	2	0	5	0	1	0
Phytophthora rot	0.5	1,325	1	2	0	4	0	0
Scuffing	0.5	1,325	4	1	2	0	0	0
Fusarium rot	0.5	1,326	2	1	1	2	0	0
Yellowing	0.4	1,327	3	0	2	0	0	0
Anthraxnose rot	0.4	1,327	1	0	2	2	0	0
Dry rot	0.2	1,329	0	2	1	0	0	0
Mushy brown decay	0.2	1,329	1	1	0	1	0	0
Cuts/punctures	0.2	1,329	3	0	0	0	0	0
Cladosporium rot	0.2	1,330	0	0	1	0	1	0
Cracking	0.2	1,330	1	0	1	0	0	0
Misshapen fruit	0.2	1,330	1	1	0	0	0	0
Black mold rot	0.1	1,331	1	0	0	0	0	0
Stem-end rot	0.1	1,331	0	0	0	1	0	0
Insect damage	0.1	1,331	0	0	0	0	1	0
Russeting	0.1	1,331	0	0	1	0	0	0

^a From 12 states, Puerto Rico, and five foreign countries.^b Minor scars, mechanical damage, and unidentified defects.**Table 7.** Parasitic diseases reported in USDA inspections of yellow (summer) and zucchini squash in Florida and Mexico shipments on the New York market, 1972-1985

Source Type	Number of shipments	Diseases and percentages of shipments affected									
		Bacterial soft rot	Cottony leak	Gray mold rot	Rhizopus rot	Unidentified decays	Alternaria rot	Phytophthora rot	Black rot	Blossom-end rot	Other
Florida	529	64.1	8.1	5.5	4.9	3.4	0.6	0.6	1.7	0.4	0.4
Yellow	101	59.4	5.9	4.0	8.9	4.0	1.0	1.0	1.0	1.0	1.0 ^a
Zucchini	402	65.7	9.2	6.0	3.7	3.0	0.2	0.5	1.5	0.2	0.2 ^b
Mexico	607	47.4	14.0	9.6	5.4	5.8	1.6	0.7	0.5	0.8	1.8
Yellow	107	45.2	9.3	9.3	8.4	5.6	0.9	0	1.9	0.9	3.7 ^c
Zucchini	473	48.4	15.0	9.5	4.9	5.9	1.7	0.8	0.2	0.6	1.1 ^d

^a Anthracnose rot.^b Mushy brown decay.^c Anthracnose and Fusarium rots.^d Fusarium, Cladosporium, and stem-end rots.

to reduce injuries that enable opportunistic organisms to cause decay. Hopefully, the information in this report will be a stimulus for the industry to develop more effective measures of maintaining quality and reducing losses in the marketing of cucurbits.

ACKNOWLEDGMENT

We thank the New York office of the USDA Fresh Fruit and Vegetable Inspection, Fresh Products Branch of the Agricultural Marketing Service for making available the inspection certificates from which the data for this report were obtained.

LITERATURE CITED

- Cappellini, R. A., Ceponis, M. J., and Lightner, G. W. 1986. Disorders in table grape shipments to the New York market, 1972-1984. *Plant Dis.* 70:1075-1079.
- Cappellini, R. A., Ceponis, M. J., and Lightner, G. W. 1987. Disorders in apple and pear shipments to the New York market, 1972-1984. *Plant Dis.* 71:852-856.
- Cappellini, R. A., Ceponis, M. J., and Lightner, G. W. 1987. Disorders in celery and carrot shipments to the New York market, 1972-1985. *Plant Dis.* 71:1054-1057.
- Cappellini, R. A., Ceponis, M. J., Wells, J. M., and Lightner, G. W. 1984. Disorders in potato shipments to the New York market, 1972-1980. *Plant Dis.* 68:1018-1020.

Table 8. Frequency of disorders reported in USDA inspections of 895 watermelon shipments^a on the New York market, 1972–1985

Disorder	Shipments affected (%)	Number of shipments affected according to incidence class (% fruit)						
		0	1-5	6-10	11-20	21-33	34-50	>50
Stem-end rot	38.5	550	91	89	84	45	25	11
Bruise damage	35.4	578	148	81	54	24	6	3
Scarring	20.0	716	122	45	10	2	0	0
Anthracoise	19.8	718	45	37	58	20	11	6
Overripe fruit	18.7	728	39	30	51	31	9	7
Grade defects ^b	15.3	758	26	64	19	16	10	2
Blossom-end rot	14.5	765	45	42	29	11	2	1
Unidentified decays	11.4	793	97	1	2	0	0	2
Soft fruit	10.7	799	47	24	17	7	1	0
Misshapen fruit	7.5	828	49	13	4	1	0	0
Anthracoise rot	4.7	853	7	14	10	4	3	4
Cracking	4.6	854	20	15	3	3	0	0
Sunburn	3.8	861	12	9	12	1	0	0
Transit rubs	3.2	866	11	10	6	1	1	0
Brown discoloration	2.0	877	7	6	1	2	1	1
Black rot	1.8	879	6	5	4	1	0	0
Bacterial soft rot	1.5	882	5	2	3	3	0	0
Rhizopus soft rot	1.3	883	3	5	3	0	0	1
Shriveling	1.2	884	5	4	2	0	0	0
Hollow heart	1.1	885	5	0	4	1	0	0
Insect damage	1.1	885	8	2	0	0	0	0
Phytophthora rot	0.8	888	4	1	0	2	0	0
Immature fruit	0.8	888	5	1	1	0	0	0
Internal rind necrosis	0.3	892	1	1	1	0	0	0
Fusarium rot	0.2	893	2	0	0	0	0	0
Freeze damage	0.2	893	0	1	0	0	1	0
Gray mold rot	0.1	894	1	0	0	0	0	0
Pitting	0.1	894	0	0	1	0	0	0

^a From 20 states, Puerto Rico, and six foreign countries.^b Minor bruises, scars, and unidentified defects.**Table 9.** Parasitic diseases reported in USDA inspections of Florida, Texas, and Mexico watermelon shipments on the New York market, 1972–1985

Source Type	Number of shipments	Diseases and percentages of shipments affected								
		Stem-end rot	Anthracoise	Blossom-end rot	Unidentified decays	Anthracoise rot	Black rot	Phytophthora rot	Bacterial soft rot	Other
Florida	301	38.2	19.9	13.6	14.3	6.6	1.7	0	1.0	1.3 ^a
Long, Charleston Gray	145	37.2	17.2	8.3	17.9	5.5	1.4	0	0	0.7
Long, striped	69	46.4	18.8	17.4	10.1	5.8	1.4	0	1.4	0
Texas	148	39.2	14.9	14.9	10.8	2.0	2.7	2.0	1.4	3.4 ^b
Long, striped	73	38.4	12.3	23.3	12.3	1.4	1.4	2.7	1.4	5.5
Mexico	143	41.3	9.1	8.4	6.3	1.4	2.8	2.8	2.1	2.1 ^c
Long, Charleston Gray	67	41.8	3.0	4.5	6.0	0	3.0	1.5	0	0
Long, striped	43	44.2	16.3	11.6	9.3	2.3	2.3	4.7	4.7	7.0

^a Rhizopus soft rot and internal rind necrosis.^b Rhizopus soft rot.^c Fusarium and gray mold rots.

- Ceponis, M. J., Cappellini, R. A., and Lightner, G. W. 1985. Disorders in crisphead lettuce shipments to the New York market, 1972–1984. *Plant Dis.* 69:1016-1020.
- Ceponis, M. J., Cappellini, R. A., and Lightner, G. W. 1986. Disorders in tomato shipments to the New York market, 1972–1984. *Plant Dis.* 70:261-265.
- Ceponis, M. J., Cappellini, R. A., and Lightner, G. W. 1986. Disorders in muskmelon shipments to the New York market, 1972–1984. *Plant Dis.* 70:605-607.
- Ceponis, M. J., Cappellini, R. A., and Lightner, G. W. 1986. Disorders in onion shipments to the New York market, 1972–1984. *Plant Dis.* 70:988-991.
- Ceponis, M. J., Cappellini, R. A., and Lightner, G. W. 1986. Disorders in citrus shipments to the New York market, 1972–1984. *Plant Dis.* 70:1162-1165.
- Ceponis, M. J., Cappellini, R. A., and Lightner, G. W. 1987. Disorders in fresh pepper shipments to the New York market, 1972–1984. *Plant Dis.* 71:380-382.
- Ceponis, M. J., Cappellini, R. A., and Lightner, G. W. 1987. Disorders in sweet cherry and strawberry shipments to the New York market, 1972–1984. *Plant Dis.* 71:472-475.
- Ceponis, M. J., Cappellini, R. A., and Lightner, G. W. 1987. Disorders in cabbage, bunched broccoli, and cauliflower shipments to the New York market, 1972–1985. *Plant Dis.* 71:1151-1154.
- Ceponis, M. J., Cappellini, R. A., Wells, J. M., and Lightner, G. W. 1987. Disorders in plum, peach, and nectarine shipments to the New York market, 1972–1985. *Plant Dis.* 71:947-952.
- Ramsey, G. B., and Smith, M. A. 1961. Market diseases of cabbage, cauliflower, turnips, cucumbers, melons, and related crops. U.S. Dep. Agric. Agric. Handb. 184. 49 pp.
- United States Department of Agriculture. 1973–1982. Fresh fruit and vegetable unloads in eastern cities. U.S. Dep. Agric. Agric. Mark. Serv. FVUS-1 (1972–1981).
- United States Department of Agriculture. 1983–1985. Fresh fruit and vegetable arrivals in eastern cities. U.S. Dep. Agric. Agric. Mark. Serv. FVAS-1 (1982–1984).