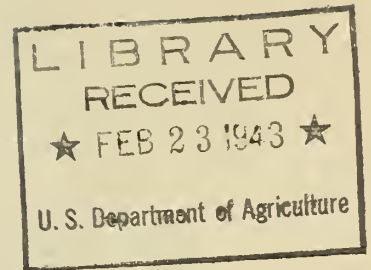


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UNITED STATES DEPARTMENT OF AGRICULTURE
U.S. Agricultural Marketing Administration



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ADEQUACY OF REFRIGERATED STORAGE SPACE FOR APPLES

By Joseph F. Herrick, Jr., Assistant Marketing Specialist

Washington, D. C.
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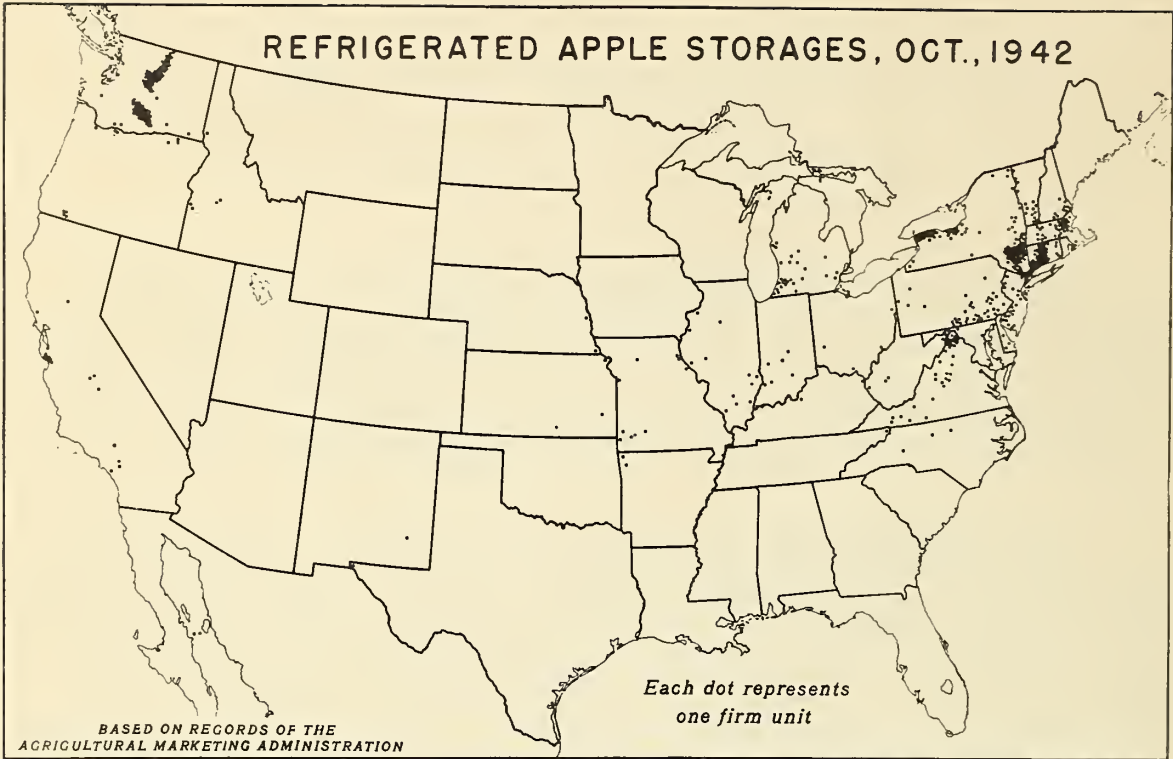
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Apple Crop Up 6 Million Bushels.- According to the October 1 estimate of the Crop Reporting Board, this year's apple crop of 128 million bushels will exceed last year's production by 6 million bushels, or approximately 5 percent (table 1). The Northeast, including Virginia, West Virginia, and Ohio, expects 9 million bushels more than last year, while the estimated production for the Pacific Coast is 1 million below last year and 4 million bushels below average.

Are Storages Adequate?- If the same proportion of the apple and pear crop is placed in storage this year as last year, the peak storage requirement will be about 38 million bushels. Refrigerated storage houses of the country, which store apples and pears almost exclusively, have a capacity of approximately 42 million bushels (table 2). However, on November 1, last year, 9 million bushels of apples and pears were being held in the general cold-storage houses, located principally in the larger cities. Information to date indicates that more than 5 million bushels are already in these houses. Therefore, if the general houses take only the quantity they took last year, this would leave approximately 29 million bushels to be cared for in apple houses which have a capacity of 13 million bushels in excess of that amount.

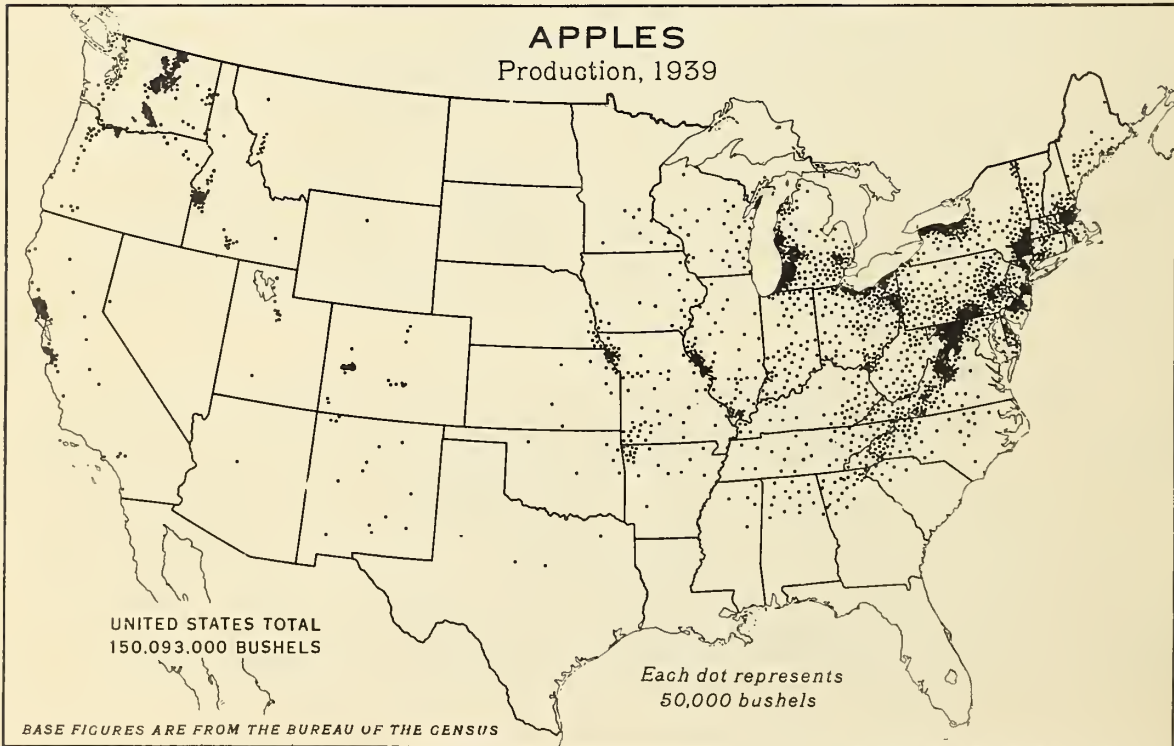
These general figures, however, do not reveal the actual storage situation in particular producing areas. As evidenced by the two maps on page 2, most of the refrigerated apple storages are concentrated in the heavy producing areas. Under normal conditions these facilities are usually adequate for local needs, but when harvests are unusually large, their capacity sometimes proves insufficient. For the country as a whole, if storage facilities in each producing region were adequate to hold occasional record harvests, there would be much unused capacity under normal conditions. This means that in exceptionally good years larger quantities must be moved to market or into storage outside the local producing area.

Other Storage Factors.- Although large crops have been the main reasons for local storage shortages, there have been other contributing factors. (1) Curtailment of motor transportation has tended to increase the quantities going into storage. Many passenger cars, and for that matter commercial vehicles, that transported apples to consuming centers at this time of year are no longer operating, or if so, are not moving the quantities they have in the past. (2) There has been a tendency for some dealers who bought apples for storage in the large markets to remain out of the market on account of price uncertainties. (3) In some areas it appears likely that fear of storage space shortages has



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resulted in reservations of space in excess of needs by certain types of dealers and shippers.

Storage Tight in Parts of New England and Lower Hudson Valley.- Production of apples is especially heavy in Massachusetts, Rhode Island, and Connecticut where the 1942 crop is estimated to be 1.7 million bushels more than last year. Thus in New England, particularly in Massachusetts, there appears to be an acute shortage of storage space. According to our estimates space for storing 582,000 bushels will be required in Massachusetts outside the apple houses (table 2). On October 1, 168,000 bushels (table 3) were reported in storage in the general cold-storage houses which could hold an additional 255,000 bushels. This would leave 159,000 bushels that would have to be moved to storages outside the State or into consumption.

Although the figures for New York as a whole indicate sufficient space, the situation in the lower Hudson Valley is comparable with the situation in Massachusetts, although production in the western part of New York State is below average. This has resulted in a shortage of storage space in the lower Hudson Valley and excess space in the western district.

Michigan Crop Exceeds Capacity.- Even if all available cooler space in the public warehouses in Michigan were completely utilized, in addition to the space in the apple houses, these facilities would not be adequate to take care of the State's 9.5 million-bushel crop, which is a 17 percent increase over last year. It would be necessary to seek facilities across State lines.

Storage on Pacific, Except Oregon, Appears Adequate.- On the Pacific Coast, although Washington's crop is estimated to be 1 percent above last year, it will fall 1.5 million bushels short of the 1934-39 average of nearly 29 million bushels. California's production is expected to be 1.7 million bushels below last year's crop, and well below the State's average of 6 million bushels. Storage space on the West Coast appears to be adequate in every State except Oregon. Oregon's production, although up from last year, is still below average. In spite of this, however, the small amount of available space in general cold-storage houses in that State will necessitate the moving of a substantial quantity of apples to other States for storage.

Where Should Apples be Stored?- Apples may be stored at 4 points: (1) In apple houses in the producing area, (2) In storage warehouses in the market where they are to be sold, (3) In storages en route between producing region and market, and, (4) At points not on a direct line between producing areas and markets.

In so far as possible, the most desirable points for storage are in the producing areas, in the market, or en route to market. With storage

at a premium now in some markets, it would seem desirable to fill local facilities first. If these are inadequate, owners, in order to conserve transportation, should make an effort to store their fruit in the normal line of movement. Where space is tight in the large markets- such as the port cities, where demands for space are rather high because of the war effort- it is desirable to store at some point en route.

Of course, if space is inadequate at all these points, it will then be necessary to store at points off the route to market. This, however, should be a last resort in view of the additional transportation required and the cost.

What Has Been Done?- Early in the season many people feared there would be a shortage of storage space for apples. This feeling was based largely on rumors that cold-storage space was unusually scarce and the expectations that production in some areas would be above normal. In order to try to cope with this problem, Federal and State agencies have worked with growers, shippers, and warehouse men in an effort to get a clear picture of the situation and to see that persons with available space and those with apples to store were brought together. Since the storage problem is not the result of an actual shortage in cooler space, but is essentially a need for getting together those who have apples to store and those who have space for the storage of apples, efforts of this kind should be helpful. Warehouse men were asked to check their reservations carefully to be sure that apples will be coming to fill their available space and to get in touch with the appropriate agencies if they can handle additional quantities. Growers who requested information were told where space is available.

Soon after November 1 the Agricultural Marketing Administration will issue another report showing for each State the space situation as of October 23. This report will show the total storage capacity, percentage occupancy, and the number of bushels of apples that could be stored in the unoccupied space. By referring to this report persons who have apples to store will have the latest information on locations of available storage space and thereby be in a position to place their products in those places least disadvantageously located with respect to production and market areas.

Table 1.- Production of apples and pears in the United States,
by State and geographic division for selected periods

State or geographic division	Commercial production of apples 1/			Production of pears 1/		
	Average :	Indicated:	Average :	Indicated	Average :	Indicated
	1934-39 :	1941 :	1942 2/:	1930-39 :	1941 :	1942 2/
	1000 bu.	1000 bu.	1000 bu.	1000 bu.	1000 bu.	1000 bu.
Maine, N. H. & Vt.....	1,746	1,930	2,447	28	20	25
Massachusetts.....	2,488	2,488	3,520	71	48	45
R. I. & Conn.....	1,627	1,662	2,387	66	84	96
New England.....	5,861	6,080	8,354	165	152	166
New York.....	16,183	16,302	17,250	1,284	848	1,251
New Jersey.....	3,404	2,632	3,397	71	44	66
Pennsylvania.....	9,090	8,643	10,802	609	350	472
Middle Atlantic.....	28,677	27,577	31,449	1,964	1,242	1,789
Ohio.....	4,998	6,000	6,300	592	392	417
Indiana.....	1,576	2,230	1,392	306	224	217
Illinois.....	3,071	3,410	2,970	505	515	432
Michigan.....	7,899	8,000	9,488	1,065	1,284	1,245
Wisconsin.....	610	810	638	-	-	-
East North Central..	18,154	20,450	20,788	2,468	2,415	2,311
Minnesota & Iowa.....	511	294	511	105	52	72
Missouri.....	1,501	1,504	1,075	322	365	425
N.D., S.D., Nebr. & Kans.	1,132	440	952	168	110	183
West North Central..	3,144	2,238	2,538	595	527	680
Del., Md. & D.C.....	3,067	2,818	3,030	92	59	63
Va. & W.Va.....	15,402	16,088	18,726	364	527	694
N. & S. Carolina.....	1,009	1,505	1,145	391	550	633
Georgia & Florida.....	418	525	427	393	556	696
South Atlantic.....	19,896	20,936	23,328	1,240	1,692	2,086
Ky. & Tenn.....	581	1,046	446	410	883	675
Ala. & Miss.....	-	-	-	565	859	919
East South Central..	581	1,046	446	975	1,742	1,594
West South Central..	771	964	616	727	1,004	1,176
Idaho.....	3,650	2,442	1,891	62	68	45
Other mountain states...	3,021	3,120	2,925	372	395	291
Mountain.....	6,671	5,562	4,816	434	463	336
Washington.....	28,758	27,000	27,216	5,537	6,954	6,662
Oregon.....	3,414	2,471	2,774	3,307	4,050	4,379
California.....	7,872	7,735	6,061	9,842	9,292	9,293
Pacific.....	40,044	37,206	36,051	18,686	20,296	20,334
United States.....	123,798	122,386	128,386	27,254	29,533	30,472

1/ Reported by the Crop Reporting Board, Bureau of Agricultural Economics

2/ Indicated in the Crop Report as of October 1, 1942

Table 2.-Capacity of apples houses, holdings of apples and pears at 1941 and expected 1942 peaks, space needed in general cold-storage houses, and unused capacity of public houses, by State and geographic division

State or geographic division	Net piling space in coolers of apple houses	1000 cu. ft.	Capacity of cold-storage holdings of apples and pears at the peak in 1941		Expected peak storage holdings of apples and pears in 1942		Holdings necessary in general public cold-storage houses at peak in 1942		Unused cooler space in public cold-storage houses in terms of bushels Oct. 1, 1942 to 1/1000 cu. ft.
			1/1000 bu.	2/1000 bu.	3/1000 bu.	4/1000 bu.	5/1000 bu.	6/1000 bu.	
Me., N. H. & Vt.	760	331	214	66	356	25	137	60	
Massachusetts	2,054	893	764	282	1,475	582	586	256	
R. I. & Conn.	2,008	873	478	111	836	--	178	77	
New England	4,822	2,097	1,456	459	2,667	570	901	392	
New York	19,083	8,297	3,237	1,800	5,440	--	4,230	1,839	
New Jersey	1,648	716	342	508	1,096	380	2,291	996	
Pennsylvania	3,125	1,359	663	778	1,801	442	3,908	1,698	
Middle Atlantic	23,856	10,372	4,242	3,086	8,337	--	10,427	4,533	
Ohio	249	108	52	508	588	480	1,933	840	
Indiana	469	204	170	120	191	--	422	183	
Illinois	1,435	624	339	413	654	30	3,413	1,484	
Michigan	938	408	163	574	951 4/	543	738	321	
Wisconsin	--	--	--	101	80	80	341	148	
East North Central	3,091	1,344	724	1,716	2,454	--	6,847	2,976	
Minn. & Iowa	--	--	--	201	338	338	563	240	
Missouri	1,291	561	182	167	279	--	1,181	614	
W.D., S.D., Nebr. & Kansas	167	73	23	59	169	96	1,323	575	
West North Central	1,458	634	206	427	786	151	3,057	1,329	
Del., Md., & D.C.	444	193	66	215	303	110	531	231	
Va. & W. Va.	13,559	5,895	3,533	794	5,083	--	1,415	615	
N.C. & S.C.	84	37	7	24	27	--	134	58	
Ga. & Fla.	--	--	--	26	27	27	1,299	565	
South Atlantic	14,087	6,125	3,606	1,059	5,420	--	3,379	1,469	
Ky. & Tenn.	205	89	10	101	64	--	246	107	
Ala. & Miss.	--	--	--	8	9	9	120	52	
East South Central	205	89	10	109	73	--	366	159	
West South Central	170	74	8	81	81	7	2,089	908	
Idaho	734	319	130	6	105	--	132	57	
Other Mountain States	15	7	--	101	92	85	403	176	
Mountain	749	328	130	107	197	--	535	233	
Washington	38,532	16,753	12,175	545	12,720	--	968	421	
Oregon	5,969	2,321	614	614	3,228	683	295	128	
California	3,784	1,645	1,300	652	1,773	128	3,398	1,478	
Pacific	48,285	20,993	15,796	1,811	17,721	--	4,661	2,027	
United States	96,723	42,054	26,177	8,655	37,746	--	32,262	14,028	

1/ 1 bushel of apples in storage estimated to require 2.3 cubic feet of net piling space.

2/ Holdings as of Nov. 1 or Dec. 1, 1941 whichever was higher. However, for California Nov. 1 was taken although lower than Dec. 1.

3/ The figures here are based on full utilization of apple houses. Totals in this column for any group of states may not equal the sum of the figures for those states, principally because excess capacity in one may offset a deficiency in another.

4/ Adjusted to take care of more complete coverage of storages this year over last.

Table 3.-Cold-storage holdings of apples and pears in all cold-storage warehouses and apple houses by State and geographic division, Oct. 1, Nov. 1, Dec. 1, 1941 and Oct. 1, 1942

State or geographic division	All cold-storage warehouses				Refrigerated apple storages				Other cold-storage warehouses			
	Oct. 1, 1941	Nov. 1, 1941	Dec. 1, 1941	Oct. 1, 1942	Oct. 1, 1941	Nov. 1, 1941	Dec. 1, 1941	Oct. 1, 1942	Oct. 1, 1941	Nov. 1, 1941	Dec. 1, 1941	Oct. 1, 1942
	1000 bu.	1000 bu.	1000 bu.	1000 bu.	1000 bu.	1000 bu.	1000 bu.	1000 bu.	1000 bu.	1000 bu.	1000 bu.	1000 bu.
Me., N.H., & Vt.	82	280	180	111	64	214	168	92	18	66	12	19
Massachusetts	537	1,046	846	509	386	764	616	341	161	282	230	168
R.I. & Conn.	46	589	499	479	--	478	388	453	46	111	111	26
New England	665	1,915	1,525	1,099	450	1,458	1,172	886	215	459	353	213
New York	3,574	5,057	4,817	4,256	2,414	3,257	2,978	2,594	1,160	1,800	1,598	1,639
New Jersey	215	750	850	391	95	340	340	111	120	410	508	280
Pennsylvania	293	1,334	1,441	612	125	617	663	219	168	717	778	293
Middle Atlantic	4,082	7,121	7,108	5,139	2,634	4,194	3,983	2,924	1,448	2,927	3,125	2,215
Ohio	93	515	560	194	12	45	52	10	81	470	508	184
Indiana	87	282	290	135	38	160	170	56	49	122	120	79
Illinois	278	698	752	380	116	247	339	105	162	451	413	275
Michigan	247	737	667	407	51	163	147	150	196	574	510	257
Wisconsin	32	91	101	48	--	--	--	--	32	91	101	48
East North Central	737	2,323	2,380	1,164	217	615	708	321	520	1,708	1,652	943
Minn. & Iowa	15	154	201	14	--	--	--	--	15	154	201	14
Missouri	161	349	326	255	69	182	166	143	82	187	160	112
N.D., S.D., Nebr. & Kans.	27	82	71	23	14	23	22	13	13	59	49	10
West North Central	193	585	598	292	83	205	188	156	110	380	410	136
Del., Md., & D.C.	48	281	265	48	11	66	71	20	37	215	194	28
Va. & W. Va.	900	4,327	4,276	1,659	751	3,533	3,322	1,342	149	794	954	317
N.C. & S.C.	10	29	31	6	4	6	7	1	6	23	24	5
Ga. & Fla.	8	26	24	23	--	--	--	--	8	26	24	23
South Atlantic	966	4,663	4,596	1,736	766	3,605	3,400	1,363	200	1,058	1,196	373
Ky. & Tenn.	15	95	111	47	3	11	10	21	12	84	101	26
Ala. & Miss.	1	8	7	--	--	--	--	--	1	8	7	--
East South Central	16	103	118	47	3	11	10	21	13	92	108	26
West South Central	30	88	89	22	4	12	8	6	26	76	81	16
Idaho	19	136	100	--	19	130	99	--	--	6	1	--
Other Mountain States	16	101	97	3	--	--	--	--	16	101	97	3
Mountain	35	237	197	3	19	130	99	--	16	107	98	3
Washington	4,276	12,285	12,720	1,830	4,100	11,226	12,175	1,805	176	1,059	545	25
Oregon	2,461	2,935	1,903	1,030	1,778	2,321	1,458	521	683	614	445	509
California	1,020	1,952	1,970	1,087	467	1,500	938	290	553	652	1,032	797
Pacific	7,757	17,172	16,593	3,947	6,345	14,847	14,571	2,616	1,412	2,325	2,022	1,331
United States	14,481	36,207	33,184	13,449	10,521	25,075	24,139	8,293	3,860	9,132	9,045	5,156

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A circular stamp with numbers 1 through 12 arranged in a circle, likely representing hours of the day. The number 11 is at the top, 12 is at the top-right, 1 is at the right, 2 is at the bottom-right, 3 is at the bottom, 4 is at the bottom-left, 5 is at the left, 6 is at the top-left, 7 is at the top, 8 is at the top-right, 9 is at the right, 10 is at the bottom-right, and 11 is at the top.