diseases, such as chalkbrood, caused by the fungus, *Ascosphaera apis*; American foulbrood (AFB), caused by the bacterium, *Bacillus larvae*; and Nosema, caused by the protozoan, *Nosema apis*, have practical control recommendations. However, in recent years, beekeepers and apicultural scientists have been trying to cope with two predaceous mites that have become greater problems for both managed and feral bee nests. Both mites were introduced into U.S. bee populations during the late 1980's and have now spread throughout the United States, Mexico, and many parts of Canada. Together, these diseases and parasites are costing beekeepers millions of dollars for treatment, colony replacement, and lost honey production.

The tracheal mite, *Acarapis woodi*, an internal parasite found in 1984, is microscopic and lives within the breathing apparatus of honeybees. The mite is extremely difficult to treat with control agents in this protected location. As of 1994, there are few good control materials and diligent research is underway at universities and USDA laboratories to provide practical control recommendations.

The newest parasite found on U.S. honeybees in 1987 is the Varroa mite, *Varroa jacobsoni*. Experience has shown that colonies afflicted with Varroa mites die—if not from the mites directly, then from secondary infections caused by the weakness. Whereas tracheal mites are very small, Varroa mites are very large by mite standards and easily visible with the unaided eye. Considered by some beekeepers to be prohibitively expensive, a commercially available fluvalinate compound is effective in controlling, albeit not eradicating, the Varroa mite.

Mites have been cited as the reason that feral honeybee populations have declined precipitously in many States. In managed honeybee colonies, the added costs of management and treatment have severely squeezed the thin profit margin in commercial beekeeping.

Herbicides and Pesticides

The widespread use of certain highly toxic chemicals to control plant and animal pests threatens honeybee colonies and costs beekeepers millions of dollars each year. Although honeybees are seldom the target organism, they suffer because of their biology and behavior. Quick-acting poisons kill field bees (foragers) before they can return to the hive. With less toxic compounds, the bees may return to die in the hive or crawl from the entrance and die nearby. Some chemicals are microencapsulated,

approximating the size of natural pollen grains, and are carried to the hive and fed to other bees and brood.

About one-third of the beekeepers responding to the Cornell University survey reported losses of honeybees from pesticides in 1988. These beekeepers indicated about 37 percent of their colonies were affected, 80 percent of which incurred 50 percent or more loss. Only 2 percent of the beekeepers reporting losses from pesticides received any form of reimbursement.

Imports

Imported honey is garnering a larger share of the honey consumed in the United States. During the 1950's and 1960's, average U.S. honey production exceeded domestic consumption. Since that time, consumption has exceeded production by an average of 33.9 million pounds in the 1970's, 70.6 million pounds in the 1980's, and 85 million pounds thus far in the 1990's. The recent surge of imports, mainly from China, to an estimated 133.6 million pounds in 1993 is putting downward pressure on domestic honey prices. The share of U.S. honey consumption supplied by imports from China increased from 8.5 percent in 1990 to 23.9 percent in 1993, displacing domestic honey production. Consequently, U.S. honey producers expressed to the Clinton Administration and the Congress their great concern with the impact of increased Chinese imports.

In October 1993, the Clinton Administration requested the International Trade Commission (ITC) to conduct a section 406 investigation on imports of lower priced honey from China. Under section 406 of the Trade Act of 1974, the President has the authority to impose import relief measures on products from communist countries when the ITC determines such imports disrupt the domestic market. Market disruption is defined to exist whenever imports of a like or directly competitive article are increasing so rapidly that they are a significant cause of material injury or threat of injury to the domestic industry.

Accordingly, effective October 6, 1993, the Commission instituted Investigation No. TA-406-13 and on January 7, 1994, delivered its determination, findings, and recommendations to the President. The Commission determined that the U.S. honey market was disrupted by imports from China and recommended some form of tariff-rate quota to remedy the threatened honey market.

On April 21, 1994, President Clinton issued a decision memorandum to Congress which stated that import relief for honey was not in the national

economic interest of the United States. However, the President instructed the U.S. Trade Representative, in consultation with appropriate agencies, to monitor imports of honey from China.

Availability of Adequate Pollination Services

Growers of fruits and vegetables, as well as other naturalists, have observed the decline in feral honeybee populations. Ironically, while the indispensability of honeybee pollination is being touted, Africanized honeybees, predaceous mites, depressed honey prices, and general industry malaise are reducing the number of colonies available for crop pollination.

Large agricultural producers can continue to import bees from other States to augment honeybee populations. However, part-time and backyard growers who frequently depend on wild honeybee populations for pollination may have problems renting colonies. Other insects, such as bumblebees or leaf cutter bees, are adept pollinators, but management of their populations is uncertain at best.

The availability of honeybee colonies could be enhanced by several factors. If bee populations develop resistance to mite infestations quickly, the feral honeybee population could rebound. The economic incentive given to commercial beekeepers to increase colony numbers in existing operations could affect availability. Finally, sideliner and hobby beekeepers, who do not normally move their colonies for rental pollination, could be enticed into becoming bee colony suppliers.

Price Support Policy Options

Reducing the cost of farm programs, in general, and terminating the honey price support program in particular have been important issues during congressional debates on the past several farm bills. However, any congressional action on the honey price support program that reduces the availability of subsidies or terminates the program will reduce the incomes of over 5,000 U.S. beekeepers.

The fate of the honey price support program will likely be determined by the 1995 farm bill. Following are several options Congress could consider if honey is included in the 1995 farm bill and the administration maintains its goal of a zero-cost honey program.

Extend Provisions of Existing Honey Program

Sections 207 and 405A of the Agricultural Act of 1949 (7 U.S.C. 1446h), as amended by the Omnibus

Budget Reconciliation Act (OBRA) of 1993 (P.L. 103-66), provides for a Honey Price Support Program for the 1994-98 honey crops. The program includes nonrecourse loans of 50 cents per pound for the 1994 and 1995 crops, 49 cents for the 1996 crop, 48 cents for the 1997 crop, and 47 cents for the 1998 crop. However, the Appropriations Acts for FY's 1994 and 1995 made the 1994 and 1995 crop-year loans recourse and provided zero dollars for subsidies and forfeitures. Program features include (1) a market loan repayment option whereby, at the Secretary of Agriculture's discretion, a producer may repay a price support loan at a lower rate; (2) loan deficiency payments that a producer may receive in lieu of a price support loan; and (3) limits on the amount of payments and loan forfeitures that a producer may collect on each crop. Since the loan rates are above the market price, market loans and loan deficiency payments are necessary to encourage redemption of loans and marketing of honey.

The provisions of the current program, as authorized in OBRA of 1993, could be extended in the 1995 farm bill to include the 1999 and 2000 honey crops. However, to achieve a zero-cost program, the existing program could be modified by making the loans recourse, that is exclude forfeitures; accelerating the decrease in loan rates to 40 cents per pound and payment limits to zero dollars by the crop year 2000; and reinstating marketing assessments. The progressively lower recourse loan rates and payment limits will result in very low government costs for subsidies and no forfeiture costs. While this program will force producers to depend more on the market and pollination fees for the majority of their income, it will provide some income protection in a sluggish and weak honey market. The marketing assessment and interest on recourse loans would most likely offset any expense to administer the program.

Adopt and Extend Provisions of Government Reform and Savings Act

The Government Reform and Savings Act (GRSA) of 1993, for the 1994 and 1995 honey crops, makes loans recourse and eliminates subsidies, reduces the loan rate to 44 cents per pound, and terminates the honey program effective for the 1996 crop. The provisions of the GRSA could be extended in the 1995 Farm Bill for the 1996-2000 honey crops by lowering the loan rate significantly below the market price, making the loans recourse to preclude storage and disposition costs of forfeited honey, and eliminating the market loan option and loan deficiency payments, which will reduce spending on subsidy payments to zero dollars. Also, the marketing

assessment could be reinstated to offset administrative costs of running a honey program.

These provisions would achieve the administration's goal of zero cost for a honey program. Also, while this program would not provide honey producers a source of income because the loans would be repaid with interest, it would provide a source of working capital.

Protect Program With Import Quotas

The beekeeping industry has maintained that a honey price support program would not be needed if honey imports were regulated to achieve a domestic honey price that provided beekeepers with a favorable return to their beekeeping operations. The industry further contends that increases in U.S. honey consumption generated by the promotional efforts of organizations like the National Honey Board are largely being supplied by imports. By controlling honey imports through a system of import quotas or tariff-rate quotas, the domestic market price for honey could be strengthened and, thus, eliminate the dependence of beekeepers on the honey program as a source of income. However, the administration maintains that import quotas are not in line with its goal of free trade of U.S. products in international markets.

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Glossary

Abdomen. The segmented posterior part of a bee containing the heart, honey stomach, intestines, reproductive organs, and sting.

Apis. Genus to which honeybees belong.

Apiarist. A person who keeps bees.

Apiary. Group of bee colonies.

Apiculture. The science of beekeeping.

Beehive. Domicile prepared for a colony of honeybees.

Beekeeper. (see *Apiarist*).

Beekeeping associations. Organizations of beekeepers at the local, regional, State, and/or national and international level that meet on a regular basis and have a mixture of educational and social activities.

Bee pasture. Vegetation visited by bees for nectar or pollen.

Beeswax. A secretion from glands on the underside of a bee's abdomen that is molded to form honeycomb upon which the colony lives.

Brood. The collective name for the egg, larvae, and pupae in a honeybee colony.

Brood chamber. The section of the hive in which brood is reared and food may be stored.

Cap. The covering of a cell with beeswax.

Cell. Single unit of space in a honeycomb in which honey is stored or honeybees can be raised.

Colony. Social community of several thousand worker bees, usually containing a queen with or without drones.

Comb. (see *Honeycomb*).

Commercial beekeeper. One who keeps bees on a full-time basis for income. The industry generally considers commercial beekeepers as maintaining 300 or more colonies.

Drone. The name given to a male honeybee.

Drone egg. Unimpregnated egg.

Extractor. A machine that rotates honeycombs at a speed sufficient to remove the honey from them.

Field bees. Worker bees 2-1/2 to 3 weeks old that collect food for the hive.

Food chamber. Hive body containing honey-filled combs on which bees are expected to live.

Foraging. The process of searching for and collecting nectar, pollen, water, and propolis by worker bees.

Frame. Wood case for holding honeycomb.

Hive. Any container in which bees are kept by a beekeeper.

Hobbyist beekeeper. One who keeps bees for pleasure or occasional income. The industry generally considers hobbyists as maintaining fewer than 25 bee colonies.

Honey. Sweet viscous fluid produced by honeybees from nectar obtained primarily from floral plants.

Honeybee. Any of several social bees of the genus *Apis*, family *Apidae*, order *Hymenoptera*, that produce honey.

Honeycomb. A group of hexagonal cells with three-faced bases that are built by honeybees from beeswax.

Honey flow. Period when bees are collecting nectar from plants in plentiful amounts.

Honey stomach. The area inside the bee abdomen between the esophagus and the true stomach.

Larva. Stage in the life of a bee between egg and pupa. A white legless grub that lies curled up on the bottom of the wax cell of the honeycomb.

Nectar. Sweet secretion, primarily a solution of dissolved sugars in varying proportions, produced in the nectaries of many flowering plants and the basic raw product of honey. The function of nectar is to attract bees so that the flowers may be cross-pollinated.

Nectaries. Special glands found primarily in flowers that secrete nectar.

Nurse bees. Young worker bees that feed the larvae.

Package bees. Bees produced for sale, supplied by the pound, and transported in a box with a wire screen on two opposite sides. The most popular size packages contain 2 or 3 pounds of adult bees, without brood or comb.

Pollen. Dustlike material produced in the male parts of flowering plants and necessary on the female parts of the flower for seed production.

Pollen basket. Area on the hindleg of a bee adapted for carrying a pellet of pollen.

Pollination. The transfer of pollen from the male parts of a flower to the female parts of the same flower or another flower of the same species.

Proboscis. The tongue of a bee.

Propolis. Resinous substance, orangey-brown to red in color, obtained by honeybees from certain trees and utilized to close small openings or cover objectionable objects within the hive.

Pupa. Stage in the life of a developing bee when the larval body is reorganized into that of the adult.

Queen. Sexually developed female bee, and under normal conditions, the mother of all the other bees in the colony.

Queen cell. The cell in which the queen develops. The queen cell is the largest cell built and hangs vertically in the hive, while the others are horizontal.

Royal jelly. Food secreted by worker bees and placed in queen cells for larval food.

Sideliner. One who keeps bees on a part-time basis. The industry generally considers sideliners as maintaining 25-299 bee colonies.

Skep. Beehive made of straw.

Smoker. Device used to blow smoke on bees to reduce stinging.

Super. Extra division of the hive above the brood nest area in which frames of honeycomb are placed, usually for honey storage.

Swarm. Natural division of a colony of bees.

Thorax. The middle part of a bee.

Tracheae. The breathing tubes of insects.

Wax glands. Glands on the underside of the bee abdomen from which wax is secreted after the bee has been gorged with food.

Wax moth. An insect whose larvae destroy wax combs.

Worker bee. The name given to a sexually underdeveloped female bee.

Worker egg. Fertilized bee egg.

Appendix table 1—Colonies of honeybees, honey and beeswax production, and yield per colony, price, and value, United States, 1945-93 crop years

Crop year	Colonies	Honey production				Beeswax production			
		Yield per colony	Quantity	Average price	Value[1]	Yield per colony	Quantity	Average price	Value[2]
	Thousands	Pounds	Million pounds	Cents per pound	Million dollars	Pounds	Million pounds	Cents per pound	Million dollars
1945	5,460	42.7	233.1	18.6	43.4	0.82	4.5	41.6	1.9
1946	5,787	36.9	213.8	24.4	52.2	0.76	4.4	44.3	2.0
1947	5,916	38.6	228.6	24.9	56.9	0.76	4.5	45.6	2.0
1948	5,724	36.0	206.3	17.9	36.9	0.70	4.0	41.7	1.7
1949	5,578	40.6	226.3	15.0	33.9	0.73	4.1	38.4	1.6
1950	5,612	41.5	233.0	15.3	35.6	0.77	4.3	42.8	1.8
1951	5,559	46.4	258.1	16.0	41.2	0.85	4.7	50.4	2.4
1952	5,493	49.5	272.0	16.2	44.1	0.87	4.8	43.1	2.1
1953	5,520	40.5	223.8	16.5	36.9	0.74	4.1	41.0	1.7
1954	5,451	39.7	216.4	17.0	36.9	0.73	4.0	44.1	1.8
1955	5,252	48.6	255.2	17.8	45.4	0.88	4.6	51.2	2.4
1956	5,195	41.2	214.0	19.0	40.7	0.79	4.1	54.6	2.2
1957	5,199	46.4	241.2	18.7	45.1	0.87	4.5	57.0	2.6
1958	5,152	50.6	260.5	17.4	45.3	0.91	4.7	46.0	2.2
1959	5,109	46.3	236.6	17.0	40.2	0.82	4.2	44.4	1.9
1960	5,005	48.5	242.8	17.9	43.5	0.88	4.4	44.0	1.9
1961	4,992	51.3	255.9	18.0	46.1	0.94	4.7	44.1	2.1
1962	4,900	50.9	249.6	17.4	43.4	0.98	4.8	44.1	2.1
1963	4,849	55.0	266.8	18.0	48.0	0.99	4.8	44.2	2.1
1964	4,840	51.9	251.2	18.6	46.7	0.97	4.7	44.3	2.1
1965	4,718	51.3	241.8	17.8	43.0	1.00	4.7	44.9	2.1
1966	4,646	52.0	241.6	17.4	42.0	0.99	4.6	46.5	2.1
1967	4,635	46.6	215.8	15.6	33.7	0.95	4.4	58.8	2.6
1968	4,539	42.2	191.4	16.9	32.3	0.84	3.8	61.6	2.3
1969	4,433	60.3	267.5	17.5	46.8	1.17	5.2	61.1	3.2
1970	4,285	51.7	221.7	17.4	38.6	1.03	4.4	60.2	2.6
1971	4,107	48.2	197.8	21.8	43.1	0.88	3.6	61.3	2.2
1972	4,085	52.8	215.6	30.2	65.1	0.98	4.0	62.1	2.5
1973	4,124	58.0	239.1	44.4	106.1	1.04	4.3	74.4	3.2
1974	4,210	44.6	187.9	51.0	95.8	0.83	3.5	114.0	4.0
1975	4,206	47.4	199.2	50.5	100.6	0.81	3.4	103.0	3.5
1976	4,269	46.4	198.0	49.9	98.8	0.79	3.4	112.0	3.8
1977	4,323	41.2	178.1	52.9	94.3	0.71	3.1	158.0	4.9
1978	4,090	56.6	231.5	54.6	126.5	0.96	3.9	174.0	6.8
1979	4,163	57.3	238.7	59.3	141.5	0.91	3.8	175.0	6.7
1980	4,141	48.2	199.8	61.5	122.8	0.94	3.9	183.0	7.1
1981	4,213	44.1	185.9	63.2	117.6	0.87	3.7	191.0	7.1
1982[3]	4,250	54.1	230.0	56.8	130.6	NA	NA	NA	NA
1983[3]	4,275	48.0	205.0	54.4	111.5	NA	NA	NA	NA
1984[3]	4,300	38.4	165.1	49.5	81.7	NA	NA	NA	NA
1985[3]	4,325	34.7	150.1	45.5	68.3	NA	NA	NA	NA
1986[4]	3,205	62.5	200.4	51.3	102.7	NA	NA	NA	NA
1987[4]	3,190	71.1	226.8	50.3	113.7	NA	NA	NA	NA
1988[4]	3,219	66.3	214.1	50.0	108.0	NA	NA	NA	NA
1989[4]	3,443	51.4	177.0	49.8	89.4	NA	NA	NA	NA
1990[4]	3,210	61.6	197.8	53.7	107.7	NA	NA	NA	NA
1991[4]	3,181	68.9	219.2	55.6	121.9	NA	NA	NA	NA
1992[4]	3,030	72.8	220.6	55.0	121.3	NA	NA	NA	NA
1993[4]	2,876	80.1	230.4	54.4	125.3	NA	NA	NA	NA

NA = Not available. [1]Represents the quantity of honey produced multiplied by the price of all domestic honey for 1945-71 and 1982-85 and estimates by NASS, USDA, for 1972-81 and 1986-93. [2]Represents the quantity of beeswax produced multiplied by the average price of beeswax. [3]Data not reported by NASS, USDA. Estimated by ASCS, USDA. [4]NASS,USDA, reinstated annual reporting of honey data. Data now based on beekeepers with five or more colonies.

Sources: National Agricultural Statistics Service (NASS) and Agricultural Stabilization and Conservation Service (ASCS), USDA.

Appendix table 2—Colony numbers, yield per colony, and honey production, by State, 1986-93 crop years[1]

State	Number of colonies				Yield per colony				Honey production			
	1986	1987	1988	1989	1986	1987	1988	1989	1986	1987	1988	1989
	--------Thousands--------				--------Pounds--------				--------Thousand pounds--------			
Alabama	41	46	42	41	42	35	42	20	1,722	1,610	1,764	820
Arizona	77	73	73	78	50	47	49	45	3,850	3,431	3,577	3,510
Arkansas	21	29	34	34	64	69	67	61	1,344	2,001	2,278	2,074
California	520	500	520	560	52	33	40	34	27,040	16,500	20,800	19,040
Colorado	41	44	48	50	78	73	83	66	3,198	3,212	3,984	3,300
Connecticut	3	2	2	2	20	34	46	40	60	68	92	80
Delaware	1	1	1	1	25	29	26	10	25	29	26	10
Florida	290	240	240	250	75	79	105	60	21,750	18,960	25,200	15,000
Georgia	115	120	115	116	41	38	41	27	4,715	4,560	4,715	3,132
Hawaii	9	9	9	9	147	190	179	135	1,323	1,710	1,611	1,215
Idaho	100	105	112	140	45	60	53	54	4,500	6,300	5,936	7,560
Illinois	30	28	28	29	27	75	69	38	810	2,100	1,932	1,102
Indiana	27	25	29	28	23	58	65	35	621	1,450	1,885	980
Iowa	40	44	49	67	59	103	129	90	2,360	4,532	6,321	6,030
Kansas	47	46	42	37	85	51	69	46	3,995	2,346	2,898	1,702
Kentucky	15	14	12	12	15	25	40	29	225	350	480	348
Louisiana	35	35	38	35	58	75	90	85	2,030	2,625	3,420	2,975
Maine	9	9	14	17	17	46	26	24	153	414	364	408
Maryland	8	7	7	9	28	35	25	16	224	245	175	144
Massachusetts	10	11	15	8	15	15	18	23	150	165	270	184
Michigan	80	80	95	102	56	68	73	70	4,480	5,440	6,935	7,140
Minnesota	136	150	150	165	78	108	129	92	10,608	16,200	19,350	15,180
Mississippi	23	19	21	24	54	60	66	33	1,242	1,140	1,386	792
Missouri	30	30	30	33	53	65	80	62	1,590	1,950	2,400	2,046
Montana	110	95	105	100	64	102	48	63	7,040	9,690	5,040	6,300
Nebraska	100	120	113	119	76	92	96	62	7,600	11,040	10,848	7,378
Nevada	9	11	9	15	40	30	30	54	360	330	270	810
New Hampshire	1	1	1	1	14	32	34	35	14	32	34	35
New Jersey	16	25	30	25	30	34	31	23	480	850	930	575
New Mexico	19	19	21	23	63	50	57	50	1,197	950	1,197	1,150
New York	92	90	94	94	32	44	59	59	2,944	3,960	5,546	5,546
North Carolina	18	20	21	25	30	48	46	38	540	960	966	950
North Dakota	290	280	230	290	107	110	66	56	31,030	30,800	15,180	16,240
Ohio	59	55	50	53	26	50	48	20	1,534	2,750	2,400	1,060
Oklahoma	15	10	10	9	48	70	55	65	720	700	550	585
Oregon	59	55	60	63	43	42	52	39	2,537	2,310	3,120	2,457
Pennsylvania	50	48	45	41	32	39	46	39	1,600	1,872	2,070	1,599
Rhode Island	1	1	1	1	15	32	39	39	15	32	39	39
South Carolina	15	15	14	15	25	34	40	19	375	510	560	285
South Dakota	201	250	245	230	113	134	74	49	22,713	33,500	18,130	11,270
Tennessee	36	35	35	25	32	55	40	25	1,152	1,925	1,400	625
Texas	117	110	114	140	62	74	76	56	7,254	8,140	8,664	7,840
Utah	35	35	36	47	45	48	41	44	1,575	1,688	1,476	2,068
Vermont	7	7	7	6	17	46	51	61	119	322	357	366
Virginia	30	25	25	23	38	48	56	20	1,140	1,200	1,400	460
Washington	75	75	65	70	48	55	47	46	3,600	4,125	3,055	3,220
West Virginia	17	21	30	32	30	41	35	44	510	861	1,050	1,408
Wisconsin	85	83	93	108	50	97	99	74	4,250	8,051	9,207	7,992
Wyoming	40	37	39	41	52	78	73	47	2,080	2,886	2,847	1,927
Other States[2]												
United States[3]	3,205	3,190	3,219	3,443	62.5	71.1	66.3	51.4	200,394	226,822	214,135	176,957

See footnotes at end of table.

Continued—

Appendix table 2—Colony numbers, yield per colony, and honey production, by State, 1986-93 crop years[1]—Continued

State	Number of colonies				Yield per colony				Honey production			
	1990	1991	1992	1993	1990	1991	1992	1993	1990	1991	1992	1993
	----------Thousands----------				---------------Pounds---------------				--------------Thousand pounds--------------			
Alabama	29	23	25	19	38	24	41	45	1,102	552	1,025	855
Arizona	67	75	70	55	48	50	54	77	3,216	3,750	3,780	4,235
Arkansas	42	47	45	50	84	79	65	73	3,528	3,713	2,925	3,650
California	480	520	470	500	42	63	67	90	20,160	32,760	31,490	45,000
Colorado	55	50	52[2]	53[2]	64	79	74[2]	73[2]	3,520	3,950	3,848[2]	3,869[2]
Connecticut	2	2[2]	2[2]	2[2]	52	2[2]	2[2]	2[2]	104	2[2]	2[2]	2[2]
Delaware	1	2[2]	2[2]	2[2]	11	2[2]	2[2]	2[2]	11	2[2]	2[2]	2[2]
Florida	220	225	220	200	95	83	104	113	20,900	18,675	22,880	22,600
Georgia	111	102	85	80	50	42	55	56	5,550	4,284	4,675	4,480
Hawaii	10	10	9	9	157	131	138	177	1,570	1,310	1,242	1,593
Idaho	140	140	135	133	40	46	51	71	5,600	6,440	6,885	9,443
Illinois	23	21	16	15	40	52	53	48	920	1,092	848	720
Indiana	22	21	15	12	47	50	31	66	1,034	1,050	465	792
Iowa	70	70	65	60	54	59	62	49	3,780	4,130	4,030	2,940
Kansas	36	35	28	23	67	52	58	57	2,412	1,820	1,624	1,311
Kentucky	8	7	4	4	44	25	30	60	352	175	120	240
Louisiana	38	40	45	47	89	70	107	86	3,382	2,800	4,815	4,042
Maine	20	13	15	15	24	42	22	36	480	546	330	540
Maryland	7	7[2]	6[2]	7[2]	19	25[2]	23[2]	27[2]	133	175[2]	138[2]	189[2]
Massachusetts	15				13				195			
Michigan	100	105	95	90	80	73	68	77	8,000	7,665	6,460	6,930
Minnesota	170	180	190	180	74	91	90	80	12,580	16,380	17,100	14,400
Mississippi	24	28	25	17	62	36	65	61	1,488	1,008	1,625	1,037
Missouri	30	28	25	24	63	65	77	78	1,890	1,820	1,925	1,872
Montana	98	86	87	87	81	92	110	98	7,938	7,912	9,570	8,526
Nebraska	118	108	96	83	56	67	75	70	6,608	7,236	7,200	5,810
Nevada	17	15[2]	15[2]	14	58	54[2]	65[2]	52[2]	986	810[2]	975[2]	728[2]
New Hampshire	1			2[2]	54				54			
New Jersey	15	11	8	9	21	31	22	28	315	341	176	252
New Mexico	29	20	18	18	71	77	68	64	2,059	1,540	1,224	1,152
New York	81	77	70	65	54	62	66	62	4,374	4,774	4,620	4,030
North Carolina	20	18	15	15	50	58	45	53	1,000	1,044	675	795
North Dakota	210	215	240	220	82	103	91	90	17,220	22,145	21,840	19,800
Ohio	42	48	43	35	51	61	33	66	2,142	2,928	1,419	2,310
Oklahoma	9	9	9	6	50	70	52	67	450	630	468	402
Oregon	61	56	52	53	42	46	49	67	2,562	2,576	2,548	3,551
Pennsylvania	41	40[2]	30[2]	28[2]	28	45[2]	41[2]	40[2]	1,148	1,800[2]	1,230[2]	1,120[2]
Rhode Island	1				31				31			
South Carolina	12	11	11	11	41	61	69	90	492	671	759	990
South Dakota	245	225	240	245	81	101	85	98	19,845	22,725	20,400	24,010
Tennessee	19	14	7	8	33	38	43	51	627	532	301	408
Texas	140	140	125	105	67	78	85	82	9,380	10,920	10,625	8,610
Utah	47	45	47	42	37	34	56	53	1,739	1,530	2,632	2,226
Vermont	6	6	6	6	65	75	63	82	390	450	378	492
Virginia	16	16	13	10	34	33	38	54	544	528	494	540
Washington	80	85	80	60	55	42	44	45	4,400	3,570	3,520	2,700
West Virginia	30	26	23	20	30	24	55	37	900	624	1,265	740
Wisconsin	112	110	105	100	75	67	66	82	8,400	7,370	6,930	8,200
Wyoming	40	41	41	34	57	52	70	55	2,280	2,132	2,870	1,870
Other States[2]		12	9	9		21	26	40		252	234	360
United States[3]	3,210	3,181	3,030	2,876	61.6	68.9	72.8	80.1	197,791	219,171	220,584	230,368

[1]Data based on beekeepers with five or more colonies.
[2]Not reported separately after 1990 to avoid disclosing data for individual operations.
[3]Total may not add due to rounding.

Source: National Agricultural Statistics Service, USDA.

Appendix table 3—World honey production, imports, and exports in selected countries, 1976-93

Year[1]	Russia[2]	China	United States	Mexico	Canada	Argentina	Brazil	Australia	Germany[3]	Japan	Total
					Million pounds						
Production:											
1976	414.5	121.3	198.0	105.5	56.0	61.7	26.5	47.2	48.5	13.4	1,092.6
1977	458.6	132.2	178.1	132.3	56.0	48.5	30.9	32.8	44.1	13.7	1,127.2
1978	394.6	165.3	231.5	119.0	67.5	77.2	35.3	40.3	33.1	18.7	1,182.5
1979	416.7	242.5	238.7	114.6	72.5	66.1	39.7	55.1	21.8	16.5	1,284.2
1980	403.4	178.6	199.8	132.3	64.4	72.8	44.1	43.0	29.8	13.7	1,181.9
1981	405.6	242.5	185.9	132.3	72.5	66.1	52.9	54.7	30.9	13.3	1,256.7
1982	410.1	299.8	230.0	99.2	67.3	72.8	55.1	49.4	39.7	16.2	1,339.6
1983	463.0	304.2	205.0	149.9	85.5	66.1	48.5	55.0	41.9	15.1	1,434.2
1984	425.5	308.6	165.1	132.3	95.5	77.2	55.1	61.7	35.3	15.0	1,371.3
1985	449.7	330.7	150.1	123.5	79.6	99.2	61.7	59.2	39.7	15.9	1,409.3
1986	463.0	352.7	200.4	119.0	75.0	79.4	59.5	55.3	35.3	12.2	1,451.8
1987	483.3	449.7	226.8	105.5	87.7	97.0	67.2	61.7	35.3	13.3	1,627.5
1988	535.7	343.9	214.1	101.7	81.8	101.4	66.1	60.9	39.7	10.7	1,556.0
1989	496.0	416.7	177.0	107.0	61.3	88.2	70.5	57.8	63.9	11.8	1,550.2
1990	520.8	425.5	197.8	112.4	70.8	103.6	66.1	60.8	50.7	10.7	1,619.2
1991	529.1	454.1	219.2	129.6	69.7	119.0	71.2	55.7	55.1	9.3	1,712.0
1992	103.6	449.7	220.6	107.7	65.3	134.5	61.7	55.1	54.4	8.4	1,261.0
1993	110.2	445.3	230.4	121.3	68.3	105.8	NA	NA	61.7	8.4	1,151.4
Imports:											
1976	0.0	0.0	66.4	0.0	4.0	0.0	0.0	0.0	110.4	52.4	233.2
1977	0.0	0.0	63.9	0.0	0.4	0.0	0.0	0.0	113.0	54.8	232.1
1978	0.0	0.0	56.0	0.0	0.5	0.0	0.0	0.0	127.1	53.9	237.5
1979	0.0	0.0	58.6	0.0	0.6	0.0	0.0	0.0	137.0	54.3	250.5
1980	0.0	0.0	49.0	0.0	0.6	0.0	0.0	0.0	144.6	44.3	238.5
1981	0.0	0.0	77.3	0.0	1.0	0.0	0.0	0.0	165.2	56.1	299.6
1982	0.0	0.0	92.0	0.0	0.5	0.0	0.0	0.0	168.5	62.1	323.1
1983	0.0	0.0	109.8	0.0	0.6	0.0	0.0	0.2	145.5	73.1	329.2
1984	0.0	0.0	128.7	0.0	0.4	0.0	1.0	0.3	163.1	73.1	366.6
1985	0.0	0.0	138.2	0.0	0.5	0.0	1.0	0.2	174.2	61.8	375.9
1986	0.0	0.0	120.0	0.0	0.6	0.0	1.3	0.0	191.8	80.1	393.8
1987	0.0	0.0	58.3	0.0	0.9	0.0	2.8	0.5	183.0	88.5	334.0
1988	0.0	0.0	55.9	[4]	1.0	0.0	2.1	0.9	186.2	83.0	329.1
1989	0.0	0.0	77.3	0.2	1.4	0.0	4.7	0.1	186.2	118.6	388.5
1990	0.0	0.0	77.0	[4]	1.2	0.0	6.0	0.1	174.1	146.5	404.9
1991	0.0	0.0	92.2	[4]	0.9	0.0	4.9	0.1	196.6	86.6	381.3
1992	0.0	[4]	114.6	[4]	1.4	0.0	0.9	0.2	196.7	71.0	384.8
1993	0.0	[4]	125.9	[4]	1.8	0.0	NA	NA	204.6	83.8	416.1
Exports:											
1976	15.9	44.2	4.7	105.5	10.5	65.5	2.0	25.3	4.4	0.0	278.0
1977	19.7	36.0	5.5	117.4	19.8	47.9	3.1	14.5	5.4	0.0	269.3
1978	22.4	42.2	8.0	99.4	14.7	79.1	8.2	9.4	8.4	0.0	291.8
1979	24.2	90.3	8.8	92.1	18.0	55.1	4.0	16.4	14.0	0.0	322.9
1980	27.6	102.4	8.5	86.9	24.0	43.3	2.5	25.2	18.3	0.0	338.7
1981	31.1	122.9	9.2	102.8	18.1	63.3	1.7	11.2	29.8	0.0	390.1
1982	30.2	145.6	8.5	88.2	21.5	65.9	0.5	28.3	29.1	0.0	417.8
1983	43.8	117.1	7.5	131.2	21.0	64.5	4/	23.9	19.8	0.0	428.8
1984	53.4	110.2	7.5	119.1	41.6	58.6	4/	38.4	22.0	0.0	450.8
1985	50.0	120.8	6.5	94.4	38.1	93.0	1.9	32.3	30.9	0.0	467.9
1986	45.4	177.7	9.2	127.8	26.1	68.2	4.3	26.2	35.3	0.0	520.2
1987	46.0	147.3	12.4	87.2	24.0	80.0	0.9	26.0	33.1	0.0	456.9
1988	38.4	102.5	14.0	86.3	31.3	91.4	0.5	29.9	33.1	0.0	427.4
1989	38.1	157.6	10.0	84.2	46.6	74.6	0.8	29.5	35.3	0.2	476.9
1990	37.7	194.0	12.4	96.4	17.1	87.5	[4]	27.0	35.3	[4]	507.4
1991	30.9	154.2	9.6	110.4	22.6	104.0	0.2	22.9	26.5	[4]	481.3
1992	2.9	202.3	10.4	81.3	24.5	121.6	0.2	22.3	29.2	[4]	494.7
1993	2.6	176.4	8.8	94.8	22.0	97.0	NA	NA	38.6	[4]	440.2

NA = Not available. [1]Calendar year for all except Australia, which begins in July of the indicated year. [2]Includes all the republics of the former Soviet Union prior to 1992, and only Russia since 1992. [3]Includes only West Germany prior to 1991. East Germany is included beginning in 1991. [4]Less than 100,000 pounds. Source: *World Honey Situation*, FAS, USDA.

Appendix table 4—U.S. honey imports, by country of origin, 1976-92 calendar years

Country of origin	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
									Million pounds								
Argentina	18.5	9.1	15.4	0.9	1.4	12.2	16.5	19.4	22.7	31.4	22.0	11.3	11.7	10.5	19.4	20.4	31.1
Australia	2.7	[1]	[1]	0.5	[1]	1.9	6.3	3.0	3.8	6.7	4.2	[1]	[1]	0.2	2.5	0.1	[1]
Brazil	2.0	2.2	8.8	4.7	1.8	1.8	0.7	[1]	[1]	1.4	4.1	0.9	0.3	0.4	0.2	0.0	0.0
Canada	5.5	15.1	8.8	9.5	17.4	11.2	14.6	15.4	34.4	32.1	19.4	14.2	11.4	27.4	7.6	14.2	16.8
China	0.6	0.6	0.7	18.0	17.5	19.0	17.5	19.3	12.1	22.6	36.5	19.4	19.8	24.9	25.5	44.8	60.1
Dominican Republic	0.7	0.8	1.3	1.3	1.0	1.2	1.7	1.0	1.7	1.6	1.5	0.5	0.5	0.4	0.4	0.2	0.5
El Salvador	0.6	1.0	0.3	0.7	[1]	1.1	1.1	1.2	1.5	1.8	3.0	0.3	0.2	0.1	0.2	0.3	0.0
Germany[2]	[3]	[3]	[3]	[3]	[3]	[3]	[3]	[3]	[3]	0.3	0.4	0.3	2.3	0.8	0.3	0.3	0.2
Guatemala	0.7	1.2	0.2	0.6	[1]	0.8	1.4	1.8	1.3	1.5	1.1	0.7	0.4	0.4	0.5	0.3	0.3
Honduras	0.7	0.2	0.4	0.5	0.1	0.7	1.5	1.0	1.1	1.1	1.3	[1]	[3]	[3]	[3]	[3]	[3]
Hong Kong	0.0	[1]	[1]	0.3	0.2	0.4	[1]	[1]	0.1	0.6	0.6	[1]	0.2	0.3	0.3	[1]	0.2
Hungary	[3]	[3]	[3]	[3]	[3]	[3]	[3]	[3]	[3]	2.2	0.4	0.4	4.4	2.7	2.5	2.6	[1]
Japan	[3]	[3]	[3]	[3]	[3]	[3]	[3]	[3]	[3]	0.1	0.3	[1]	0.0	[1]	0.1	0.5	0.2
Mexico	31.0	32.7	18.3	20.3	8.4	24.9	27.6	44.1	46.1	33.7	23.2	9.1	3.2	6.5	16	7.9	4.7
Russia[4]	[3]	[3]	[3]	[3]	[3]	[3]	[3]	[3]	[3]	[1]	0.7	0.5	0.8	1.8	0.6	0.1	[1]
Switzerland	[3]	[3]	[3]	[3]	[3]	[3]	[3]	[3]	[3]	0.4	0.2	0.2	[1]	0.4	0.2	[1]	[1]
Other	3.4	1.0	1.8	1.3	1.2	2.1	3.1	3.6	3.9	0.7	1.1	0.5	0.7	0.5	0.5	0.5	0.5
Total volume	66.4	63.9	56.0	58.6	49.0	77.3	92.0	109.8[1]	28.7	138.2	120.0	58.3	55.9	77.3	77.0	92.2	114.6

[1] Less than 100,000 pounds.
[2] Includes only West Germany prior to 1991. East Germany is included beginning in 1991.
[3] Any imports are included in other category.
[4] Includes all the republics of the former Soviet Union prior to 1992, and only Russia since 1992.

Source: U.S. Department of Commerce, Bureau of the Census.

Appendix table 5—U.S. honey exports, by country of destination, 1976-92 calendar years

Country of origin	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
										Million pounds							
Belgium-Luxembourg	[1]	[1]	[1]	0.1	[1]	0.1	[1]	[1]	[1]	[1]	0.2	0.3	0.2	[1]	0.2	0.1	0.4
Canada	0.4	0.3	0.5	0.4	0.5	0.4	0.4	0.5	0.8	0.3	0.2	0.5	0.4	0.7	0.9	0.9	1.0
China	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	[1]	1.0
France	[2]	0.1	0.3	0.6	0.2	0.2	0.3	0.1	[1]	[1]	0.1	0.2	[1]	[1]	0.2	0.2	[1]
Germany[3]	1.1	1.6	1.8	1.6	1.8	2.1	2.1	1.0	0.6	0.8	3.2	4.8	4.5	1.7	3.1	1.6	0.4
Hong Kong	[2]	[2]	[1]	[1]	0.1	0.2	0.2	0.1	0.1	0.3	0.3	0.9	0.3	0.1	[1]	0.2	0.2
Japan	0.7	0.5	0.7	0.6	0.5	0.5	1.0	0.8	0.7	1.1	0.6	0.7	0.9	1.0	1.5	0.5	1.0
Mexico	[2]	[2]	[2]	[2]	[2]	[2]	[1]	[1]	[1]	0.2	0.0	0.0	0.4	0.3	[1]	[1]	0.0
Kuwait	[2]	[2]	0.1	[1]	0.2	0.4	0.2	0.4	0.6	0.6	0.5	0.5	0.5	0.6	0.3	0.2	0.3
Netherlands	0.7	0.5	1.4	1.6	1.0	1.4	1.3	0.7	1.0	0.4	1.5	0.4	0.9	0.2	0.9	0.2	0.6
Philippines	[2]	[2]	[2]	[1]	[1]	[1]	0.2	0.2	[1]	0.0	0.1	[1]	0.6	0.2	0.6	0.2	0.4
Saudi Arabia	0.2	1.0	1.4	1.5	2.1	1.5	1.5	2.2	1.7	1.2	1.2	2.1	3.0	2.6	2.4	2.4	1.5
Singapore	[1]	[1]	0.1	0.2	[1]	[1]	0.1	[1]	[1]	[1]	0.1	0.3	0.6	0.2	0.1	0.1	[1]
Sweden	[1]	[1]	[1]	[1]	[1]	[1]	[1]	[1]	[1]	[1]	[1]	[1]	0.1	0.2	0.1	[1]	0.1
United Arab Emirates	[1]	[1]	[1]	0.2	0.3	0.4	0.3	0.3	0.4	0.2	0.3	0.5	0.5	0.4	0.4	0.8	0.4
United Kingdom	0.3	0.1	0.3	0.4	0.3	0.2	0.2	0.2	0.5	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.1
Yemen	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.7	1.0	1.8
Other	1.1	1.3	1.3	1.5	1.5	1.7	0.7	0.9	0.7	1.1	0.7	0.8	0.7	1.1	0.8	0.8	1.2
Total volume	4.7	5.5	8.0	8.8	8.5	9.2	8.5	7.5	7.5	6.5	9.2	12.4	14.1	9.9	12.4	9.6	10.4

[1] Less than 100,000 pounds.
[2] Any imports are included in other category.
[3] Includes only West Germany prior to 1991. East Germany is included beginning in 1991.

Source: U.S. Department of Commerce, Bureau of the Census.

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