



Many crops require insects to move pollen from one flower to another. Pollination ensures fruit set, proper development, more fruit, and viable seed. **Honey bees** are the **most important insect pollinator** for crops grown in North Carolina.

- Vegetable and fruit crops that require honey bees include cucumbers, blueberries, watermelons, apples, squash, strawberries, melons, and peaches.
- Forage crops that benefit from honey bee pollination include alfalfa, cotton, peanuts, and soybeans.
- Averaged over the last five years, honey bees have directly accounted for approximately **\$96 million** in annual fruit and vegetable production (67.9%) and approximately **\$186 million** in total annual crop productivity (24.5%) (*Table 1*).

Since the mid-1980s, honey bees have been plagued by two exotic parasitic mites that can kill entire colonies if left untreated. The result has been a **dramatic drop** in the state's **honey bee population**

- The estimated number of **managed** hives in the state has declined from a high of 180,000 hives before the mite introduction to **only 100,000 hives** currently.
- Most **wild honey bee colonies**, which also served as pollinators, **have been wiped out** by these mites.

It is now necessary that growers of bee-dependent crops **rent hives** to ensure proper and successful pollination.

- Pollination rentals often require **pollination contracts** between growers and beekeepers to ensure an adequate number of honey bees in the crop during the bloom period.
- An estimated **240,000 hives will be required for pollination in 2007** (*Table 2*), which exceeds the number of managed hives in the state. Thus it is vital to **contract pollinators well ahead of the date they are needed**.

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To **locate beekeepers in your area**, contact your local Cooperative Extension Office, the North Carolina Department of Agriculture and Consumer Services, or visit the **"BeeLinked"** web site at:

<http://www.ncagr.com/beelinked>

Table 1. The value of NC agriculture directly attributable to honey bee pollination.

FRUITS AND VEGETABLES	Total Value of Production (\$1000s of dollars)					D	P	Value attributable to honey bees (\$1000s of dollars)					
	2002	2003	2004	2005	2006			2002	2003	2004	2005	2006	5 Year Avg.
Apples	22,205.000	17,103.000	16,630.000	13,859.000	19,799.000	100%	90%	19,984.500	15,392.700	14,967.000	12,473.100	17,819.100	16,127.280
Blueberries	22,534.000	34,777.000	32,235.000	36,702.000	48,745.000	100%	90%	20,280.600	31,299.300	29,011.500	33,031.800	43,870.500	31,498.740
Brambles	583.440	938.250	1,003.920	1,003.920	1,025.280	80%	90%	420.077	675.540	722.822	722.822	738.202	655.893
Cucumbers (fresh)	12,075.000	13,260.000	11,340.000	8,400.000	13,299.000	90%	90%	9,780.750	10,740.600	9,185.400	6,804.000	10,772.190	9,456.588
Cucumbers (pickled)	23,490.000	23,612.000	19,404.000	19,952.000	10,260.000	90%	90%	19,026.900	19,125.720	15,717.240	16,161.120	8,310.600	15,668.316
Grapes	2,934.000	2,989.000	3,366.000	3,653.000	4,624.000	10%	10%	29.340	29.890	33.660	36.530	46.240	35.132
Melons	20,000.000	20,000.000	20,000.000	20,000.000	20,000.000	80%	90%	14,400.000	14,400.000	14,400.000	14,400.000	14,400.000	14,400.000
Peaches	3,500.000	2,400.000	2,940.000	5,100.000	5,115.000	60%	80%	1,680.000	1,152.000	1,411.200	2,448.000	2,455.200	1,829.280
Pumpkins	2,000.000	2,000.000	2,000.000	2,000.000	2,000.000	90%	10%	180.000	180.000	180.000	180.000	180.000	180.000
Squash	10,260.000	8,430.000	9,000.000	9,860.000	11,480.000	90%	10%	923.400	758.700	810.000	887.400	1,033.200	882.540
Strawberries	19,125.000	15,300.000	15,840.000	18,525.000	19,440.000	20%	10%	382.500	306.000	316.800	370.500	388.800	352.920
Watermelons	9,503.000	6,825.000	6,300.000	7,259.000	12,960.000	70%	90%	5,986.890	4,299.750	3,969.000	4,573.170	8,164.800	5,398.722
Subtotal	148,209.440	147,634.250	140,058.920	146,313.920	168,747.280			93,074.957	98,360.200	90,724.622	92,088.442	108,178.832	96,485.411
(% of total value)								62.8%	66.6%	64.8%	62.9%	64.1%	64.2%
FORAGE CROPS													
Alfalfa (hay)	5,000.000	5,940.000	3,120.000	106,080.000	115,872.000	100%	60%	3,000.000	3,564.000	1,872.000	63,648.000	69,523.200	28,321.440
Cotton (lint)	163,263.000	322,051.000	253,286.000	315,910.000	281,424.000	20%	80%	26,122.080	51,528.160	40,525.760	50,545.600	45,027.840	42,749.888
Cotton (seed)	25,704.000	37,692.000	41,795.000	38,548.000	3,945.000	20%	80%	4,112.640	6,030.720	6,687.200	6,167.680	631.200	4,725.888
Peanuts	45,990.000	73,280.000	77,112.000	56,448.000	49,459.000	10%	20%	919.800	1,465.600	1,542.240	1,128.960	989.180	1,209.156
Soybeans	174,305.000	306,180.000	257,550.000	222,329.000	274,176.000	10%	50%	8,715.250	15,309.000	12,877.500	11,116.450	13,708.800	12,345.400
Subtotal	414,262.000	745,143.000	632,863.000	739,315.000	724,876.000			42,869.770	77,897.480	63,504.700	132,606.690	129,880.220	89,351.772
(% of total value)								10.3%	10.5%	10.0%	17.9%	17.9%	13.7%
TOTAL	562,471.440	892,777.250	772,921.920	885,628.920	893,623.280			135,944.727	176,257.680	154,229.322	224,695.132	238,059.052	185,837.183
(% of total value)								24.2%	19.7%	20.0%	25.4%	26.6%	23.2%

D = Dependency of crop on insect pollination for fruit set
 P = Proportion of insect pollinators that are honey bees

Resources: Delaplane, K. S. and D. F. Mayer. (2000). *Crop Pollination by Bees*. CAB International, Cambridge.

McGregor, S. E. (1976). *Insect Pollination Of Cultivated Crop Plants*. Agriculture Handbook No. 496, USDA-ARS, U.S. Gov. Print. Office, Washington, DC.

Morse, R. A. & N. W. Calderone. (2000). The value of honey bees as pollinators of U.S. crops in 2000. *Bee Culture* 128: 1-15.

National Agricultural Statistics Service

Table 2. Estimated number of hives required for NC pollination in 2007.

CROP	Recommended Hives/acre	Estimated Values for 2007	
		Acreage	No. hives needed
Apples	1.5	6,740	10,110
Blueberries	3.0	5,240	15,720
Brambles	0.8	245	196
Cucumbers (fresh)	2.2	5,510	12,122
Cucumbers (pickled)	2.2	78,360	172,392
Melons	1.5	4,000	6,000
Peaches	0.2	1,200	240
Pumpkins	1.5	1,500	2,250
Squash	1.5	3,730	5,595
Strawberries	3.5	1,460	5,110
Watermelons	1.8	6,090	10,962
TOTAL		114,075	240,697

