



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 **\$88 million** in annual fruit and vegetable production (67.9%) and approximately **\$154 million** in total annual crop productivity (24.5%) (*Table 1*).

Since the mid-1980's, 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 **132,000 hives will be required for pollination in 2006** (*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)					
	2000	2001	2002	2003	2004			2000	2001	2002	2003	2004	5 Year Avg.
Apples	12,261.000	11,250.000	22,205.000	17,103.000	16,630.000	100%	90%	11,034.900	10,125.000	19,984.500	15,392.700	14,967.000	14,300.820
Blueberries	18,130.000	18,900.000	22,534.000	34,777.000	32,235.000	100%	90%	16,317.000	17,010.000	20,280.600	31,299.300	29,011.500	22,783.680
Brambles	.	.	583.440	938.250	982.560	80%	90%	.	.	420.077	675.540	707.443	601.020
Cucumbers (fresh)	11,900.000	10,764.000	12,075.000	13,260.000	11,340.000	90%	90%	9,639.000	8,718.840	9,780.750	10,740.600	9,185.400	9,612.918
Cucumbers (pickled)	24,300.000	24,147.000	23,490.000	23,612.000	19,404.000	90%	90%	19,683.000	19,559.070	19,026.900	19,125.720	15,717.240	18,622.386
Grapes	2,661.000	2,532.000	2,934.000	2,989.000	3,366.000	10%	10%	26.610	25.320	29.340	29.890	33.660	28.964
Melons	.	.	20,000.000	20,000.000	20,000.000	80%	90%	.	.	14,400.000	14,400.000	14,400.000	14,400.000
Peaches	4,440.000	1,400.000	3,500.000	2,400.000	2,940.000	60%	80%	2,131.200	672.000	1,680.000	1,152.000	1,411.200	1,409.280
Pumpkins	.	.	2,000.000	2,000.000	2,000.000	90%	10%	.	.	180.000	180.000	180.000	180.000
Squash	9,200.000	9,750.000	10,260.000	8,430.000	9,000.000	90%	10%	828.000	877.500	923.400	758.700	810.000	839.520
Strawberries	17,325.000	16,660.000	19,125.000	15,300.000	15,840.000	20%	10%	346.500	333.200	382.500	306.000	316.800	337.000
Watermelons	8,640.000	7,513.000	9,503.000	6,825.000	6,300.000	70%	90%	5,443.200	4,733.190	5,986.890	4,299.750	3,969.000	4,886.406
Subtotal	108,857.000	102,916.000	148,209.440	147,634.250	140,037.560			65,449.410	62,054.120	93,074.957	98,360.200	90,709.243	88,001.994
<i>(% of total value)</i>								60.1%	60.3%	62.8%	66.6%	64.8%	67.9%
FORAGE CROPS													
Alfalfa (hay)	5,940.000	7,200.000	5,000.000	5,940.000	3,120.000	100%	60%	3,564.000	4,320.000	3,000.000	3,564.000	1,872.000	3,264.000
Cotton (lint)	363,538.000	254,564.000	163,263.000	322,051.000	253,286.000	20%	80%	58,166.080	40,730.240	26,122.080	51,528.160	40,525.760	43,414.464
Cotton (seed)	44,441.000	25,704.000	25,704.000	37,692.000	41,795.000	20%	80%	7,110.560	4,112.640	4,112.640	6,030.720	6,687.200	5,610.752
Peanuts	.	.	45,990.000	73,280.000	77,112.000	10%	20%	.	.	919.800	1,465.600	1,542.240	1,309.213
Soybeans	.	.	174,305.000	306,180.000	257,550.000	10%	50%	.	.	8,715.250	15,309.000	12,877.500	12,300.583
Subtotal	413,919.000	287,468.000	414,262.000	745,143.000	632,863.000			68,840.640	49,162.880	42,869.770	77,897.480	63,504.700	65,899.013
<i>(% of total value)</i>								16.6%	17.1%	10.3%	10.5%	10.0%	13.2%
TOTAL	522,776.000	390,384.000	562,471.440	892,777.250	772,900.560			134,290.050	111,217.000	135,944.727	176,257.680	154,213.943	153,901.007
<i>(% of total value)</i>								25.7%	28.5%	24.2%	19.7%	20.0%	24.5%

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

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

Table 2. Estimated number of hives required for NC pollination in 2006.

CROP	Recommended		Estimated Values for 2006 No. hives needed
	Hives/acre	Acreage	
Alfalfa (hay)	3.0	10,800	32,400
Apples	1.0	5,400	5,400
Blueberries	5.0	4,960	24,800
Brambles	3.0	240	720
Cucumbers (fresh)	2.0	6,140	12,280
Cucumbers (pickled)	2.0	16,220	32,440
Melons	1.0	4,500	4,500
Peaches	0.2	1,080	216
Pumpkins	1.0	1,500	1,500
Squash	1.0	2,520	2,520
Strawberries	1.0	1,620	1,620
Watermelons	2.0	6,800	13,600
TOTAL		63,120	131,996

