

**AMERICAN AND EUROPEAN FOULBROOD
IN COLONIES OF HONEY BEES
IN CONNECTICUT**

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The Connecticut Agricultural Experiment Station, New Haven

American and European Foulbrood In Colonies of Honey Bees In Connecticut

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The Office of the State Entomologist, in accordance with Section 22-89 of the General Statutes, inspects colonies of the honey bee, *Apis mellifera* L., for diseases, the most important of which are the bacterial diseases commonly known as foulbroods. Inspections have been carried out yearly since 1910. In this Bulletin the incidence of foulbrood in 1974 is compared with the incidence in previous years.

METHODS

Bacillus larvae, which causes American foulbrood, kills mature larvae and young pupae after the brood cells have been sealed. *Streptococcus pluton* which causes European foulbrood usually kills young larvae.

In 1974, 6% of the registered colonies, selected at random in each county, were examined. Infections were identified by characteristic odors and were verified microscopically. Samples of brood comb were taken to the laboratory for examination. Dead larvae were examined for spores of *B. larvae*.

During the period 1910-1973 as many colonies as possible were examined by the inspectors. All known colonies were inspected from 1941-1946 and possibly in 1949. In the other years between 1910 and 1973 the inspectors tended to inspect colonies in areas where foulbrood was known to occur. Thus the disease incidence recorded for these years is higher than the actual level throughout the state.

RESULTS

In 1974, less than 1% of the colonies examined were found infected with American foulbrood (Table 1). This incidence was similar to rates of infection

Table 1. Incidence of American Foulbrood in Connecticut, 1974

| County | No. of colonies | |
|------------|-----------------|----------|
| | Examined | Infected |
| Litchfield | 68 | 0 |
| Hartford | 78 | 0 |
| Windham | 28 | 0 |
| Tolland | 27 | 2 |
| Fairfield | 66 | 0 |
| New Haven | 64 | 0 |
| Middlesex | 26 | 0 |
| New London | 66 | 2 |
| Total | 423 | 4 |

recorded in previous years (Table 2). Infected colonies were encountered in the 1974 random sample of hives only in Tolland and New London counties although American foulbrood occurs in all counties in Connecticut.

European foulbrood was prevalent at the time the inspection service was initiated in 1910 (Table 2). However, the disease declined rapidly until 1% or less of the inspected colonies were infected in 1921

Table 2. Incidence of American and European Foulbrood in Connecticut, 1910-1973*

| Year | Apiaries | | | Colonies | | | Year | Apiaries | | | Colonies | | |
|------|-----------|----------------|---------|-----------|----------------|---------|------|-----------|----------------|---------|-----------|----------------|---------|
| | inspected | No. % infected | EFB AFB | inspected | No. % infected | EFB AFB | | inspected | No. % infected | EFB AFB | inspected | No. % infected | EFB AFB |
| 1910 | 208 | 76 | 0 | 1595 | 50 | 0 | 1943 | 2635 | 0 | 7 | 14903 | 0 | 3 |
| 1911 | 162 | 52 | 0 | 1571 | 27 | 0 | 1944 | 2451 | <0.1 | 8 | 12360 | <0.1 | 3 |
| 1912 | 153 | 48 | 0 | 1431 | 24 | 0 | 1945 | 2589 | <0.1 | 6 | 13353 | <0.1 | 2 |
| 1913 | 189 | 44 | 0 | 1500 | 25 | 0 | 1946 | 2827 | 0 | 6 | 11920 | 0 | 2 |
| 1914 | 463 | 33 | 1 | 3882 | 14 | 1 | 1947 | 1925 | 0 | 6 | 9648 | 0 | 3 |
| 1915 | 494 | 26 | 1 | 4241 | 10 | 0.2 | 1948 | 2165 | <0.1 | 7 | 11837 | 0.1 | 2 |
| 1916 | 467 | 19 | 1 | 3898 | 7 | 0.2 | 1949 | 2423 | 0 | 8 | 13416 | 0 | 3 |
| 1917 | 473 | 17 | 0.4 | 4506 | 5 | 0.2 | 1950 | 2277 | <0.1 | 7 | 12899 | <0.1 | 2 |
| 1918 | 395 | 10 | 1 | 3047 | 3 | 0.3 | 1951 | 2632 | 0 | 4 | 13895 | 0 | 1 |
| 1919 | 723 | 7 | 3 | 6070 | 1 | 1 | 1952 | 2299 | 0.1 | 6 | 9691 | <0.1 | 3 |
| 1920 | 762 | 4 | 1 | 4797 | 2 | 0.3 | 1953 | 2324 | 0 | 6 | 11406 | 0 | 3 |
| 1921 | 751 | 4 | 2.5 | 6972 | 1 | 1 | 1954 | 2201 | 0 | 5 | 11605 | 0 | 2 |
| 1922 | 797 | 4 | 1 | 8007 | 1 | 0.3 | 1955 | — | — | — | 13166 | — | 1 |
| 1923 | 725 | 2 | 1 | 6802 | 0.4 | 0.3 | 1956 | 2316 | 0.1 | 3 | 9294 | <0.1 | 1 |
| 1924 | 953 | 2 | 1 | 8929 | 1 | 0.2 | 1957 | 2355 | <0.1 | 3 | 9253 | <0.1 | 1 |
| 1925 | 766 | 2 | 3 | 8257 | 1 | 0.5 | 1958 | 2218 | 0.1 | 4 | 9712 | 0.1 | 1 |
| 1926 | 814 | 3 | 2 | 7923 | 1 | 0.3 | 1959 | 2409 | 0 | 3 | 10146 | 0 | 1 |
| 1927 | 803 | 1 | 3 | 8133 | 0.3 | 1 | 1960 | 2425 | <0.1 | 3 | 9517 | <0.1 | 1 |
| 1928 | 852 | 1 | 4 | 8023 | 0.3 | 1 | 1961 | 1720 | 0 | 1 | 7013 | 0 | 0.5 |
| 1929 | 990 | 0.2 | 5 | 9559 | <0.1 | 1 | 1962 | 1702 | 0 | 3 | 7186 | 0 | 1 |
| 1930 | 1059 | 0.3 | 5 | 10335 | <0.1 | 1 | 1963 | 1737 | 0 | 3 | 7371 | 0 | 1 |
| 1931 | 1232 | 0.1 | 3 | 10678 | <0.1 | 1 | 1964 | 1583 | 0 | 3 | 7198 | 0 | 1 |
| 1932 | 1397 | 0 | 4 | 11459 | 0 | 1 | 1965 | 1700 | 0 | 3 | 7572 | 0 | 1 |
| 1933 | 1342 | 0 | 2 | 10927 | 0 | 0.5 | 1966 | 1690 | 0 | 3 | 7179 | 0 | 1 |
| 1934 | 1429 | 0.1 | 2 | 7128 | <0.1 | 1 | 1967 | 2073 | <0.1 | 3 | 7800 | <0.1 | 1 |
| 1935 | 1333 | 0 | 6 | 8855 | 0 | 2 | 1968 | 1655 | 0 | 4 | 6668 | 0 | 2 |
| 1936 | 1438 | 0.1 | 6 | 9278 | <0.1 | 2 | 1969 | 1520 | 0 | 4 | 7241 | 0 | 2 |
| 1937 | 1438 | 0 | 7 | 10253 | 0 | 2 | 1970 | 1396 | 0 | 3 | 4983 | 0 | 2 |
| 1938 | 1609 | 0 | 8 | 10705 | 0 | 2 | 1971 | 1592 | 0 | 3 | 6157 | 0 | 1 |
| 1939 | 1627 | 0 | 5 | 8936 | 0 | 2 | 1972 | 1301 | 0 | 3 | 5184 | 0 | 1 |
| 1940 | 1719 | 0 | 9 | 8552 | 0 | 4 | 1973 | 651 | 0.2 | 7 | 3013 | <0.1 | 3 |
| 1941 | 2222 | 0 | 8 | 10720 | 0 | 4 | | | | | | | |
| 1942 | 2354 | 0 | 10 | 13777 | 0 | 4 | | | | | | | |

*Data taken from the annual report of the Office of the State Entomologist.

and thereafter. European foulbrood was not found in the random sample of colonies.

American foulbrood was first found in Connecticut in 1914 (Table 2). Incidence of colony infection rose to 4% in the 1940s, but has fluctuated from less than 1% to 3% since then. The percentage of American foulbrood-infected apiaries reached as high as 10% in 1942, although in more recent years the incidence has averaged 4%.

Table 3 shows the average annual incidence of foulbrood in Connecticut by county from 1910-73. Incidence was highest in Fairfield County and lowest in Windham and Tolland Counties.

It is apparent that the incidence of American foulbrood has not increased in the past 30 or more years, although the disease is present in all parts of the state and is a potential hazard to beekeepers. European foulbrood is now rarely encountered in Connecticut.

Table 3. Average Annual Incidence of American Foulbrood in Connecticut Colonies of Honey Bees, 1914-1973, by County.

| County | Percent infected | |
|------------|------------------|----------|
| | Apiaries | Colonies |
| Litchfield | 3.9 | 1.4 |
| Hartford | 3.4 | 1.2 |
| Windham | 2.3 | 0.8 |
| Tolland | 2.1 | 1.0 |
| Fairfield | 7.3 | 2.3 |
| New Haven | 6.4 | 2.0 |
| Middlesex | 3.7 | 1.3 |
| New London | 6.3 | 1.8 |

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