Nectar and Pollen Plants

Knowing the nectar and pollen producing plants in an area is an essential part of beekeeping. To quote from Le Maistre's 1943 *Beekeeping for Beginners in Alberta:*

> *An intimate knowledge of the clover acreage in any given district should be sufficient guide to its suitability for honey production, when due consideration is given to the question of rainfall.*

While this quotation does not mention canola or alfalfa, it points to the fact that even with the best management, bees cannot produce honey without a source of the raw materials: nectar and pollen.

While the control of nectar production is, to some extent, genetic, any factor that affects either the day-to-day or long term well being of the plant will also affect nectar secretion. Different plant species have different requirements for optimum secretion. Soil moisture, soil type, precipitation, air temperature and the number of sunshine hours may all affect the quantity of nectar secreted and its sugar concentration. In a drought situation, for instance, fields of canola may bloom for only a short time, and during that time, the quantity of nectar secreted will be minimal; any available water will be utilized for plant maintenance and development first.

Beekeepers refer to a "honey flow" when they see surplus honey being stored in their hives. Perhaps the term "nectar flow" is more apt since it is the nectar that flows from the flowers and is collected and changed into honey by the bees. The nectar flows are generally fairly well delineated on the prairies, whereas in other areas of Canada, such as the west coast, the flows may be less intense and stretched out over longer periods.

There are three nectar flows in most regions of the prairies:

- the spring flow
- the main or summer flow
- the late or fall flow

Honey from the lesser spring and fall flows is usually left for the bees, for spring build-up and overwintering purposes, respectively. The main nectar flow supplies the surplus honey harvested by the beekeeper. Generally, the three nectar flows are accompanied by pollen flows because nearly all the major prairie nectar plants, with the exception of alfalfa, are visited for pollen as well.

The beekeeper should know when the nectar flows begin in his or her area and how long they last. Records of scale colony gains and losses have been kept at Beaverlodge Research Station since 1954. These dates (Figure 18 and Table 3) will give the beekeeper a general idea of what to expect, but allowance must be made for different regions, climatic regimes and cropping patterns as well as yearly variations in weather patterns.

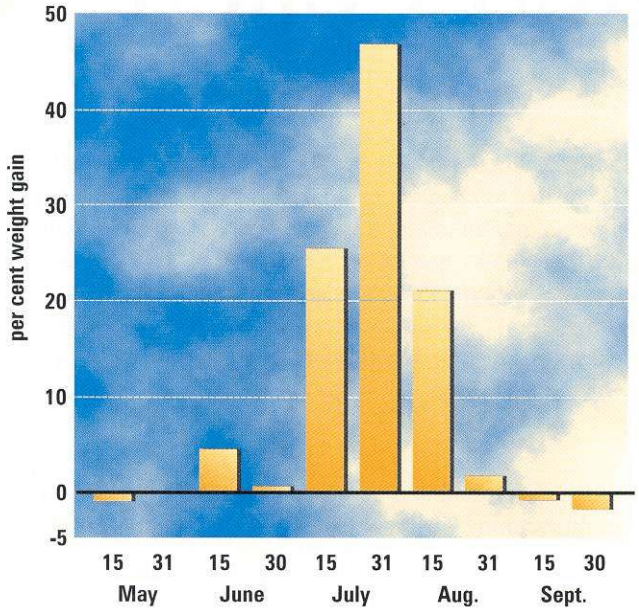

Figure 18.
Scale colony gains, Beaverlodge 1954-76.

Generally, the spring flow occurs from the end of April to the end of May or mid-June. The main flow occurs from the end of June to the end of July, and the late flow in August and sometimes into September. To know when the flows and dearth periods are occurring, the beekeeper may wish to have a colony on a scale in the home apiary. With periodic scale readings, such information is immediately available, and management techniques can be adjusted accordingly.

Table 3. Records of average nectar flow dates at Beaverlodge, Alberta, (latitude 55° N) from 1954 to 1976. Pollen was obtained from all crops except alfalfa.

Forage source	Date of nectar flow
Willow	May 10 - June 10
Dandelion	May 27 - June 27
Hawk's-beard	June 1 - Frost
Alsike clover	June 20 - Frost
Canola	June 28 - August 10
Alfalfa	June 28 - Frost
Sweet-clover	June 28 - Frost
Red clover (single cut)	July 10 - Frost
Fireweed	July 5 - August 5

Taken from Henn, G. D. and D. L. Nelson, 1977. An analysis of Beaverlodge nectar flow records. Agriculture Canada Contribution No. NRG 77-6.

Nectar plants may be divided into major and minor categories. Bees collect nectar and pollen from many different plant species, but only a few of these plants grow in enough profusion and produce enough nectar that a surplus of honey may be harvested (Figure 19). As well, nectar production by a particular plant species may vary under different soil and climatic conditions.

Plants considered a major nectar source in one region may be only a minor source in others. Yearly variations may also cause minor honey plants to occasionally yield heavily or major plants to yield poorly. Again, the beekeeper must become familiar with the peculiarities of his or her own region through observation of flowering plants and dates, and weather and scale colony records.

Figure 19A. Dandelion

Figure 19B. Willow

Figure 19C. Canola

Figure 19D. Alfalfa

Major nectar plants include the following:

- willows and dandelions in the spring
- canola, alfalfa, sweet clover, white clover, red clover, alsike clover, faba bean and sainfoin in mid summer
- sunflower, buckwheat, borage and second blossom alfalfa in the late summer to early fall

Minor honey plants include the following:

- caragana
- hawk's-beard
- pin and choke cherries
- saskatoon berry
- currant
- raspberry
- sow-thistle
- aster
- thistles
- goldenrod
- fireweed
- poplar, elm and other deciduous trees also contribute some pollen in the early spring.

As well, many horticultural crops and ornamentals are good nectar and pollen plants. Apple and other fruit trees, lilac, some of the honeysuckles, poppies and many of the herbs such as borage and thyme, to name but a few, all yield nectar or pollen and are freely visited by foraging honey bees. For the backyard beekeeper, it may even be desirable to plant a "bee garden" to supply the bees with extra nectar and pollen sources.

Each species of plant produces nectar with unique properties that, in turn, affects its value as a honey crop. Characteristics of honey such as its colour, aroma, flavour, sugar composition and speed of granulation are all influenced by the nectar source (see Chapter 7).

Colour is one of the most important factors affecting honey grading and consequently, the price the producer receives for the crop. In general, light coloured honeys such as those produced from clover, alfalfa and canola tend to sell for a higher price when sold in bulk quantities. Darker coloured honeys classed as golden, amber or dark tend to sell for a lower price.

Sunflower and buckwheat, which bloom later in the season, produce golden and dark coloured honey, respectively. Each of these floral sources produces honey with a strong and distinctive flavour that if mixed with the remaining honey crop, will lower colour grade and affect taste, which can lower the price received for the entire crop. Thus, it is often desirable to separate honey from these sources during the extracting process. In some instances, these distinctly flavoured honeys can even be marketed as a specialty and sold at a premium price.

A few plants yield nectar or pollen toxic to honey bees or nectar that, when converted to honey, is poisonous to humans. One case of bee poisoning in the Brooks area of Alberta is documented in the 1935 annual report of the Apiculture Branch. From 50 to 90 per cent of the field bees were lost from affected hives in the apiary during the middle of June that year. The cause of the poisoning was pollen or nectar obtained from narrow-leaved milk vetch, *Astragalus pectinatus*. Fortunately, cases of poisoning are rare; very few plant species in North America may cause such problems. Other plants that produce honey toxic to bees or humans include other *Astragalus* species, mountain laurel (*Kalmia* sp.), rhododendrons and azalias.