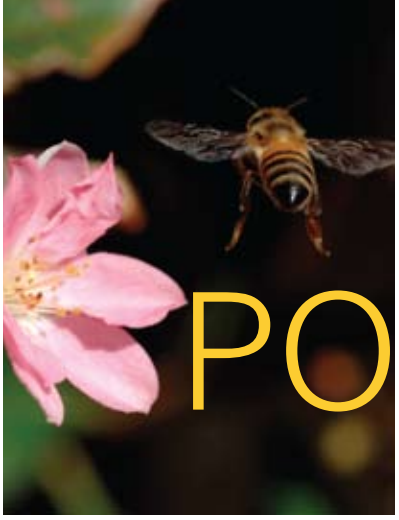

POLLINATION– it is a bee-autiful thing

By Scott Schell

Few insects have a more positive image with the general public than the honeybee (*Apis mellifera*).

Every schoolchild knows about the hardworking honeybee, and almost all enjoy the sweet product of this insect's labor; however, fewer people realize the importance of the honeybee to modern agricultural production. Many of the fruits, nuts, and vegetables that provide variety and flavor to our diets depend upon honeybees for pollination. Without this pollination service, some crops' yields would fall so dramatically they would not be commercially viable.

Recent data shows Wyoming has approximately 50,573 hives that each produces an average of 66 pounds of honey annually. To give some perspective to that figure, it is estimated it takes 2 million honeybee visits to flowers just to make one pound of honey.

Backyards Beekeeping

Many people who choose to live in the country are intrigued by the idea of beekeeping. All of the basic equipment to start with one hive and bees can be purchased as kits for less than $400. The most difficult part of keeping honeybees in Wyoming is making sure they will have a sufficient supply of nectar and pollen to gather.

Even hobby beekeepers must abide by governmental regulations (see page 7 under Bee Background). In the Rocky Mountain region, sweet clover, alfalfa, and dandelion are the most important plant species for beekeepers. The honeybee is not native to the United States, and it is interesting to note these three plants are also introduced. How these plants are managed in your area can greatly impact honey production. For example, alfalfa grown for forage is often cut when a very small percent of the plants are in bloom to maximize protein content of the hay, while alfalfa grown for seed is allowed to bloom completely.

It is generally not considered economical to plant nectar crops just for honeybees, but, to get more honey than the colony needs to survive in bad flower years, it may be necessary; either that or you may occasionally need to

Honeybees on a comb frame.

Honeybees collect pollen from a Daucus umbel plant.

supply supplemental food to your honeybees.

The next most difficult task is proper management of the honeybees to keep them healthy and not a nuisance to neighbors. For example, if you don't provide a water source for your bees on a hot day, they may swarm your neighbor's bird bath and cause a tiff.

Even in the winter, honeybee hives can vex the neighbors if they aren't well located. How? While the honeybees spend most of the winter inside the hive, they still consume honey to generate body heat to keep the queen alive. On warm winter days, the worker bees must fly out of the hive to defecate. Having 30,000 honey bees spotting your neighbor's vehicles and house will not win many friends.

Bee Behavior

It takes a lot of plants flowering throughout a growing season to support a colony of up to 50,000 workers. Worker honeybees readily fly up to four miles in all directions of the hive searching for nectar and pollen sources. The hive is perennial, meaning the queen and the colony as a whole live from year to year. No workers live longer than nine months and most only several weeks. The hive consists of one mated queen, which may live for several years, thousands of sterile female worker bees, and some drones. A drone is a male bee that is characteristically stingless and produces no honey; its only function is to mate with a new queen if necessary. The old queen has already mated, usually with several males, one time shortly after she emerged from her pupal chamber and has stored all the sperm she needs for the rest of her life.

Honeybees undergo complete metamorphosis, meaning they have an egg stage, a feeding larval stage, a non-feeding pupal stage, and, lastly, a winged, adult stage.

Many worker honeybees have to be produced by the queen as they will usually live less than six weeks in the summer. The honeybees work hard to provision the hive with honey and pollen for the colony to successfully live through the winter. In the winter, the honeybees cluster around the queen and "shiver" muscles to give off body heat to keep her at 80 degrees F on the inside of the cluster. The worker bees, which constantly move within the ball of bees, keep the outside of the cluster around 45 degrees F. It takes a lot of honey to provide the food energy for the workers to do this over the winter.

Befuddled Bees

Honeybees have been in the news a lot recently and not for a good reason. Beekeepers began experiencing unusually high losses of bee colonies after the winter of 2006. Worker bees appeared to fly away from the hives and never return, leaving behind broods and stores of honey.

Reports of similar past behavior had been recorded as early as 1896 but never to this extent. This problem has been named Colony Collapse Disorder (CCD) and prompted action from the government, research institutions, and industry.

Many environmental factors, parasites, and diseases have been postulated as the agent for this problem, but no single thing has been found to be the cause; however, Israeli acute paralysis virus has very often been found to be present in bees at CCD locations. News stories citing speculation that cell phone signals, genetically modified grain crops, and the insecticide imidacloprid are the causative agents of CCD must be taken with a grain of salt.

For example, Australia has both cell phones and imidacloprid but no varroa mites *(Varroa destructor)*, a parasite of honey bees, and has not yet documented any CCD. Australia is trying very hard to keep it that way, but all it takes is one selfish beekeeper breaking the quarantine to introduce the parasitic mites and the many viral diseases they vector.

Bee Background

Because of their importance to agriculture, honeybees and beekeeping are regulated by state and federal governments. Even hobby beekeepers, who in Wyoming are people with one to five hives, must register their location with the Wyoming Department of Agriculture (WDA). Many towns have ordinances prohibiting beekeeping. People interested in having hives need to check.

Under the Wyoming Apiculture Act of 1983, violations can bring fines up to $500 per day. Besides regulating the location of hives, the WDA also inspects for the presence of diseases such as foulbrood and chalkbrood that can cause extensive colony losses. The registration of hive locations makes it possible for pesticide applicators to know where the hives are and to coordinate with beekeepers to protect the bees. Compared to the past when very toxic, long-lasting, chlorinated hydrocarbon-based insecticides were in widespread use, the risk to honeybees has been reduced.

Flying back to the hive covered with pollen.

With the arrival of West Nile virus, more Wyoming communities are now conducting mosquito control programs. A good adult mosquito control program does little harm to honeybees. The insecticide products used for larval mosquitoes pose no risk to honeybees.

If honeybees have a downside, it is that they will occasionally sting people, especially in defense of the hive. Worker honeybees are reluctant to sting as their stingers are barbed and pull out of their bodies, causing death to the bees. It is estimated that fewer than two people in 1,000 are truly allergic to bee stings. If you are not allergic, the average person can survive up to 10 stings per pound of body weight without lasting harm.

If you are stung by a honey bee, scrape the stinger free with a blunt-edged object like a credit card. Don't pinch the stinger as that will force more venom in to the wound.

Any symptoms beyond localized slight swelling and mild pain should be dealt with by health professionals to be on the safe side.

Scott Schell is the assistant extension entomologist with the University of Wyoming Cooperative Extension Service. He can be reached at (307) 766-2508 or sschell@uwyo.edu.

Bee-autiful Information

There is an amazing amount of good information available to the would-be beekeeper. If it was easy everyone would do it, and what kind of a challenge would that "bee"?

Wyoming State Beekeepers Association

Milt Miller
P.O. Box 519
Dubois, WY 82513
(307) 455-2570

The Backyard Beekeeper: An Absolute Beginner's Guide to Keeping Bees in Your Yard and Garden, by Kim Flottum

Beekeeping: A Practical Guide, by Richard E. Bonney

Bees: Biology and Management, by Professor Peter Kevan

Online resources

BEE Briefs at http://entomology.ucdavis.edu/faculty/Mussen/beebriefs/index.cfm

Getting Started in Beekeeping at http://entomology.ucdavis.edu/faculty/Mussen/beebriefs/Started.pdf

The latest information on apiculture from University of California, Davis, Extension Apiculturist Eric Mussen is at http://entomology.ucdavis.edu/faculty/mussen/news.cfm