



United States
Department of
Agriculture

Farm Service Agency

Natural Resources
Conservation Service

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Bee Poplar

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Helping People Help the Land

The Bee and the Flower

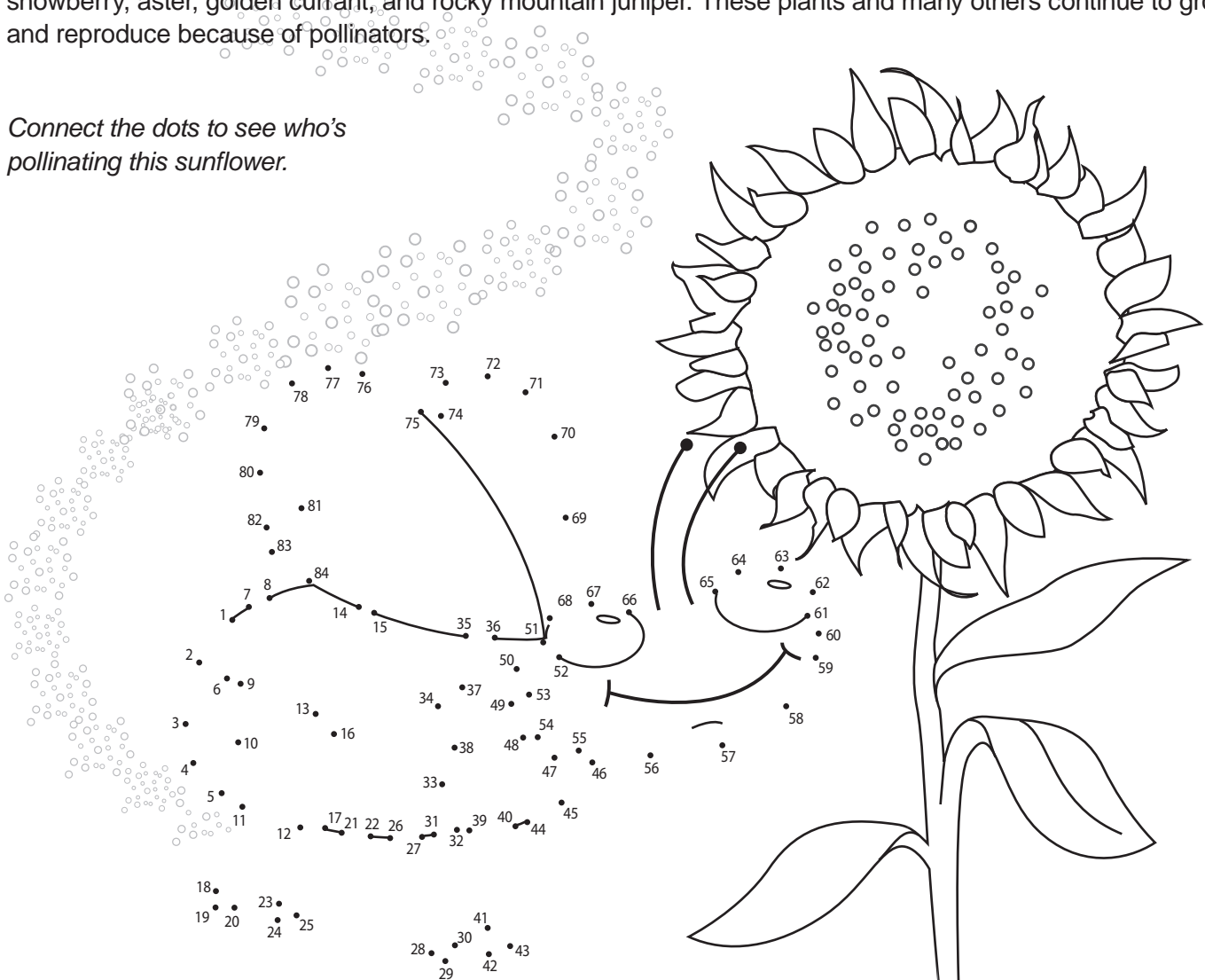
Pollen is a fine to coarse powder made by plants. The pollen consists of grains carrying male cells. Pollination happens when the pollen is moved to a female part of a flower. Most flowering plants rely on nature to move this pollen around. Without pollination, most flowering plants could not produce fruit or seeds.

The Pollinated

Many plants rely on bees, butterflies, hummingbirds, bats, moths, flies, and beetles to move the pollen around (pollination). We call special plant helpers, like bees, "pollinators"! Pollinators visit flowers to collect pollen or the sweet liquid called nectar. As they visit the flowers, the pollinators brush against the reproductive parts of the flower, dropping the pollen from another flower they recently visited. About three-quarters of the world's flowering plants and many of the food crops eaten in North America depend upon pollinators. No pollination would mean no apples, blueberries, strawberries, chocolate, almonds, melons, peaches, pumpkins, or many of the other important foods we love to eat each day. We would also not have plants that are used for medicine to make us feel better.

Certain plants that live in Montana actually attract pollinators! Some of these plants include American plum, sunflower, blue elderberry, purple coneflower, chokecherry, columbine, yucca, cherry tree, huckleberry, snowberry, aster, golden currant, and rocky mountain juniper. These plants and many others continue to grow and reproduce because of pollinators.

Connect the dots to see who's pollinating this sunflower.



The Pollinators

Bees – Bees include bumblebees and honeybees. Bees prefer blue or yellow flowers, like sunflowers, and flowers that smell sweet.

Butterflies – Butterflies taste with their feet! Butterflies like flowers that are red, yellow, or orange, like the color of the purple coneflower's center. Smell doesn't matter to butterflies; they rely more on seeing than smelling to find nectar.

Hummingbirds – To survive, many hummingbirds must eat twice their body weight in nectar each day! Hummingbirds are attracted to orange, yellow, or red flowers, like the color of the red columbine. Like most birds, hummingbirds do not have great smell features, so they don't care what the flower smells like.

Bats – Some bats travel more than 1,000 miles every spring. Bats like flowers that are large and white or pale in color. Some bat-pollinated flowers are open only at night. Bats pollinate many fruit crops, including bananas!

Moths – What is the difference between a moth and a butterfly? Generally, the moth only flies at night and has multiple shapes of antennae. The butterfly flies during the daylight and has knobs at the ends of its wiry antennae. Both are attracted to sweet-scented flowers that are typically large and white or pale in color, including desert plants like the yucca.

Flies – Flies can be found on flowers of many colors, usually those that give easy access to nectar. Montana-grown cherries are an example of a plant that flies help pollinate.

Wasps – Although wasps are not vital for pollination in Montana, they still help pollinate the fruit we eat, such as figs and huckleberries.

Beetles – Beetles are the oldest pollinators on earth and pollinate many of the most primitive flowering plants, such as the aster. Beetles are typically attracted to flowers that are white or green and have a wide opening.

Draw a line from each pollinator to the kind of plant it likes.

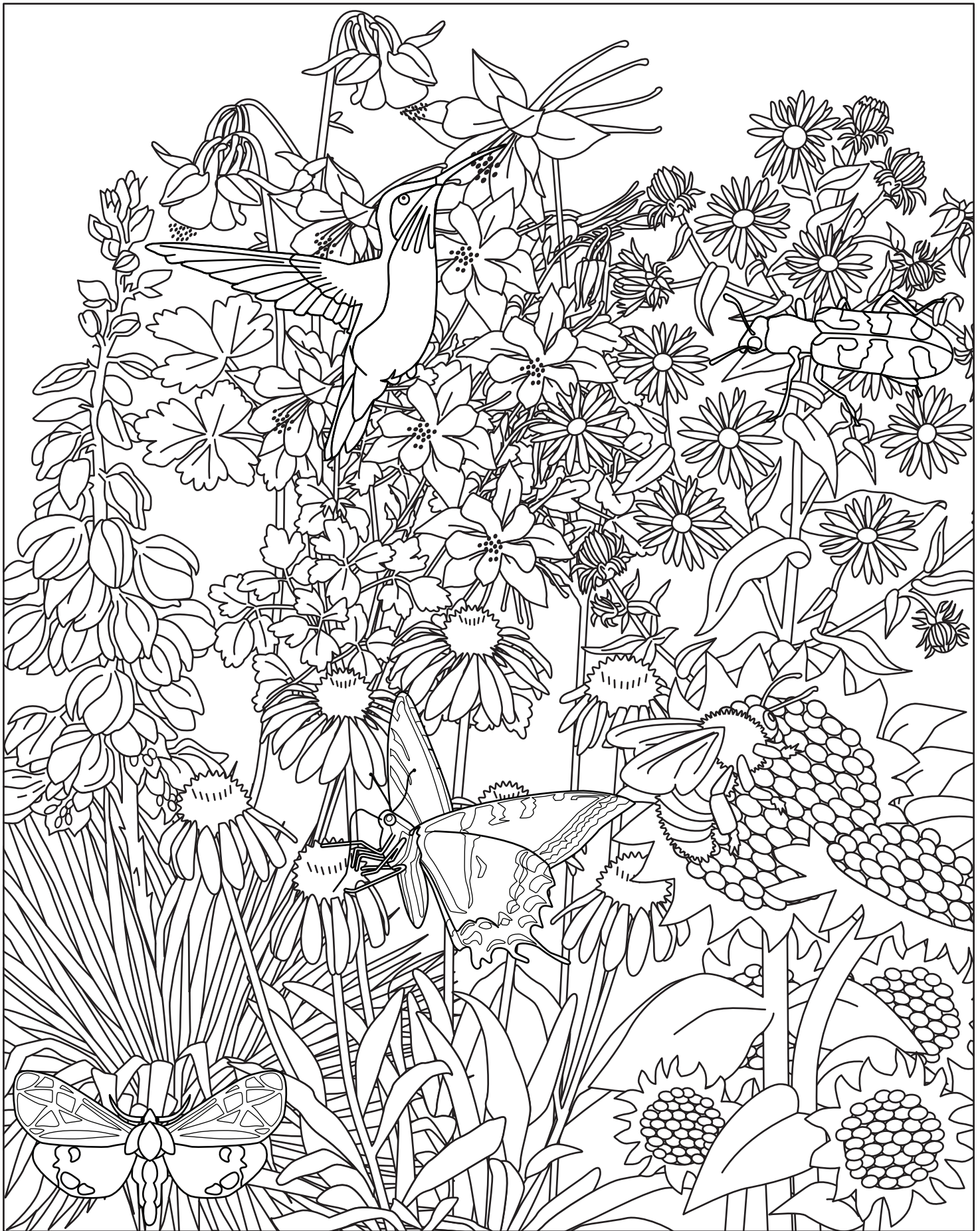
Labels for pollinators: butterfly, beetle, hummingbird, wasp, bee, moth, fly, bat.

Labels for plants: sunflower, purple coneflower, aster, red columbine, banana tree, cherry tree, huckleberry, yucca.

Where Are the Pollinators?

Look through the pictures on pages 4 and 5 to see if you can find all the hidden pollinators. Find a bee, butterfly, hummingbird, bat, moth, fly, wasp, and beetle! When you find them, color them in.





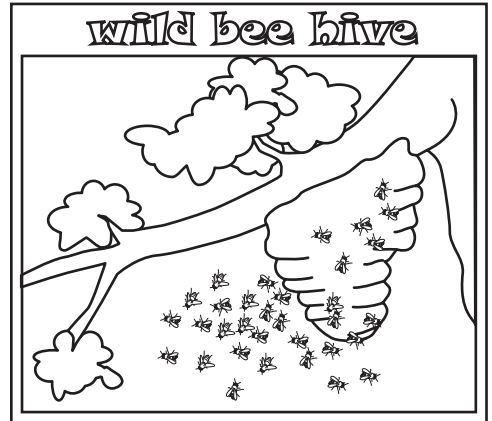
The Pollen, the Bee, and the Hive

Honeybees are fuzzy and carry an electrostatic charge that makes pollen grains stick to their bodies. Some types of bees actually carry pollen in a tiny basket located on their hind legs.

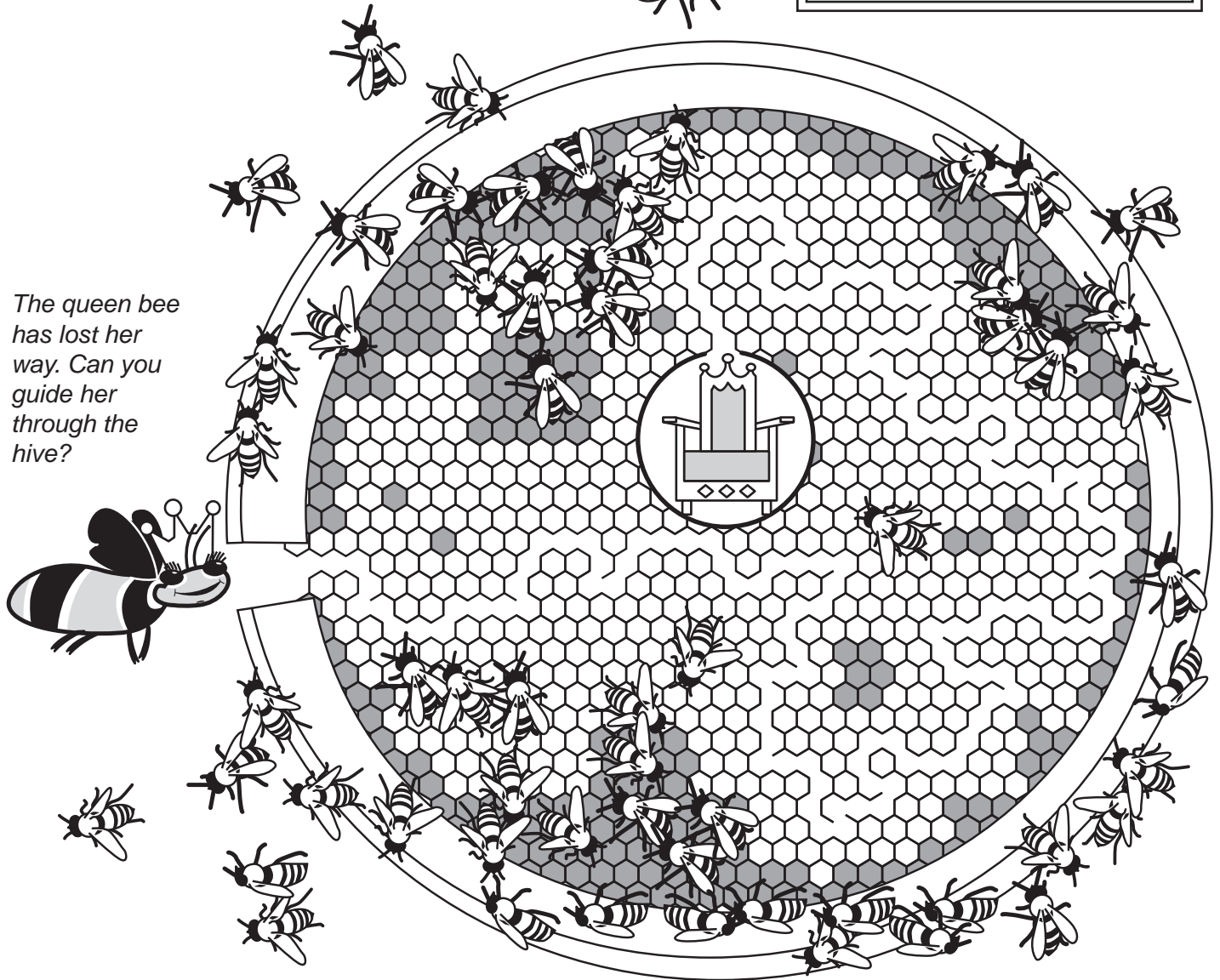
Wild bees live in hives that usually have only one entrance. The hives are made up of wax called honeycombs that store honey and house the baby bees, or larva. Bees have many different jobs. Some work inside the hive while others work outside. A beehive has one queen bee that creates all the baby bees and is served by hundreds of male bees and thousands of female worker bees that clean the hive, feed the larva, and gather the pollen.

Did You Know?

- There are 20,000 known species of bees.
- Honeybees are the only insects that produce food for humans.
- Bees fly an average of 13 to 15 miles per hour.
- Queens will lay almost 2,000 eggs a day at a rate of 5 or 6 a minute.
- Between 175,000 and 200,000 eggs are laid per year.



The queen bee has lost her way. Can you guide her through the hive?







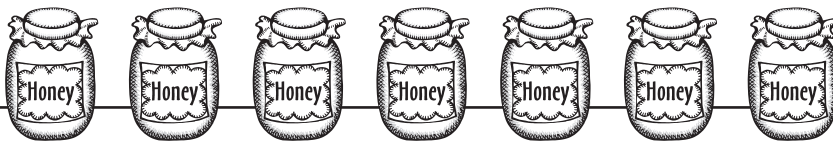
Hives and Honey - "Bee" a Beekeeper

Beekeepers have the important job of making sure bees have plenty of food and a good "hive" to live in so the bees continue their work making honey and pollinating fruits and flowers.

If you decide you would someday like to become a beekeeper, there are a few things you will need to get started: a hive (or house) for the bees; bees (buy or collect them from trees and walls); protective clothing (which should be white or tan in color) to keep you from getting stung by the bees; and special tools (to harvest and handle the honey crop). You must keep your hives at least three miles away from other beekeepers' hives. Hives should not be placed near homes or children's play areas. Hives do need to be near fresh water and fruit and pollen sources. The best time to start your bee colonies is in the spring or early summer.

Bee Facts

-  Montana is one of the top 10 honey-producing states in the nation.
-  There are about 200 beekeepers in Montana.
-  Bees raised by at least 36 Montana beekeepers are sent to growers in California, Oregon, Washington, and other states to help pollinate almond, orange, apple, and other crops.
-  Montana beekeepers produced over 9.1 million pounds of honey in 2007 with a value of \$8.6 million!
-  Honeybees visit about 2 million flowers just to make one pound of honey.



All these words have something to do with beekeeping. Find and circle them in the word puzzle.

- NECTAR
- FRUIT
- PRODUCTION
- FLOWERS
- POLLINATE
- BEEKEEPER
- APPLE
- POLLEN
- STUNG
- POUNDS
- MILLION
- HONEY

X	R	E	S	Y	J	V	V	K	U	U	D	T	L	Y
X	N	T	Q	N	Z	I	Y	I	G	H	A	A	G	P
T	G	S	R	D	N	E	J	A	N	A	P	P	L	R
O	M	I	L	L	I	O	N	T	R	M	P	O	F	O
B	P	O	L	L	I	N	A	T	E	Z	L	U	L	D
L	Y	V	W	O	A	N	R	X	N	V	E	N	O	U
V	B	Z	X	G	T	O	B	M	J	I	X	D	W	C
N	E	C	T	A	R	T	N	N	C	P	X	S	E	T
J	W	N	Z	O	F	R	U	I	T	O	A	U	R	I
Z	B	E	E	K	E	E	P	E	R	L	T	H	S	O
O	D	D	Y	H	O	N	E	Y	T	L	E	L	J	N
X	L	Y	L	M	U	S	X	W	N	E	E	Z	U	U
V	W	H	S	T	U	N	G	F	E	N	M	A	E	X
I	D	Y	H	I	N	R	U	T	R	I	T	K	U	F
S	U	S	T	J	H	W	P	H	O	C	A	L	C	Q

The Disease that Makes Bees Disappear

Many bees are getting sick, and scientists are studying possible causes of the illness so, in the future, bees will be better protected. The disease, called "Colony Collapse Disorder" (CCD), has led to the disappearance of many bees from beekeepers' colonies.

How do beekeepers know when their bees are getting sick?

- There are not many adult bees left in a hive.
- There is no build-up of dead bees in the hive (infected bees just disappear).
- Other bees are not trying to steal food left in a hive.

CCD happens very quickly. Over a few days or weeks, most of an infected colony's 40,000 or so worker bees leave and die in the field. Only a queen bee and some newly emerged young bees remain alive. This is a serious problem, not just for the bees but for all of us, because pollination by honeybees is essential to grow fruit, nut, and vegetable crops around the world. When the honeybees die, our food supply is decreased.

There is no answer to what causes CCD. Some ideas about possible causes include exposure of the bees to chemicals, infectious germs or viruses, colony stress, or problems with the biological development of the species.

What we can do to help? We can increase pollinator-friendly habitat in our backyards by growing the right plants!



Unscramble the words on the left and match them with the "bee" words on the right.

- | | |
|----------|----------|
| nequeu | honey |
| cposelal | queen |
| hyone | worker |
| eeasdis | collapse |
| eadd | disease |
| nyocol | field |
| dielf | plant |
| vihe | hive |
| lapnt | colony |
| erwkor | dead |

Pollinators Are Important

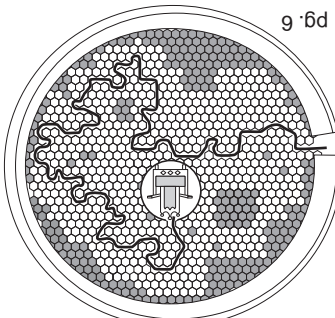
In Montana, native trees, shrubs, forbs, and grasses can, with the proper mix, provide a continuous source of nectar and pollen needed by pollinators and other beneficial insects. The Natural Resources Conservation Service (NRCS) and the Farm Service Agency (FSA), both agencies of the United States Department of Agriculture (USDA), encourage the planting of native pollinator-friendly plants that:

- Provide habitat and winter cover for insects
- Help suppress undesirable weed seeds
- Provide some biological control of insect and disease pests
- Reduce the risk of soil erosion
- Provide food and shelter for native wildlife species

Preservation of pollinators is supported by both NRCS and FSA in selected conservation programs.

pg. 8
nequeu = queen
cposelal = collapse
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dielf = field
vihe = hive
lapnt = plant
erwkor = worker

pg. 7



pg. 3

pg. 2

Answer Keys: