

The Oklahoma Cooperative Extension Service WE ARE OKLAHOMA

The Cooperative Extension Service is the largest, most successful informal educational organization in the world. It is a nationwide system funded and guided by a partnership of federal, state, and local governments that delivers information to help people help themselves through the land-grant university system.

Extension carries out programs in the broad categories of agriculture, natural resources and environment; family and consumer sciences; 4-H and other youth; and community resource development. Extension staff members live and work among the people they serve to help stimulate and educate Americans to plan ahead and cope with their problems.

Some characteristics of the Cooperative Extension system are:

- The federal, state, and local governments co-operatively share in its financial support and program direction.
- It is administered by the land-grant university as designated by the state legislature through an Extension director.
- Extension programs are nonpolitical, objective, and research-based information.
- It provides practical, problem-oriented education

for people of all ages. It is designated to take the knowledge of the university to those persons who do not or cannot participate in the formal classroom instruction of the university.

- It utilizes research from university, government, and other sources to help people make their own decisions.
- More than a million volunteers help multiply the impact of the Extension professional staff.
- It dispenses no funds to the public.
- It is not a regulatory agency, but it does inform people of regulations and of their options in meeting them.
- Local programs are developed and carried out in full recognition of national problems and goals.
- The Extension staff educates people through personal contacts, meetings, demonstrations, and the mass media.
- Extension has the built-in flexibility to adjust its programs and subject matter to meet new needs. Activities shift from year to year as citizen groups and Extension workers close to the problems advise changes.



Key to Female Bumble Bees of Oklahoma

EXTENSION

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Teri Cocke
Graduate Student

Emily Geest
Graduate Student

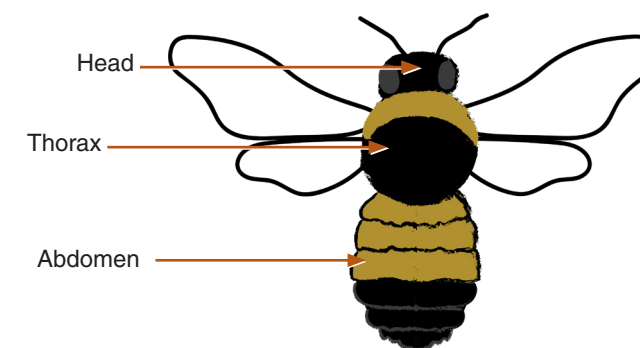
Andrine Shufan
Associate Extension Specialist

Bumble Bee Importance

Bumble bees (*Bombus* spp.) belong to the family Apidae, and are generalist pollinators that provide vital pollination services for horticultural and agronomic production as well as wild flowering plants. Bumble bees use a unique form of pollination called 'buzz pollination' in which they grasp flowers while moving their wings at a high rate. This buzz pollination behavior helps release pollen from plants that have evolved to require it. Female bumble bees will collect loose pollen from their bodies to pack into the pollen basket (corbicula) which is located on each back lower leg, to take back to the nest. Bumble bees provide critical pollination services worldwide.

Identification

All insects have three body regions (head, thorax and abdomen), two pairs of wings and six legs. Use color patterns across head, thorax and abdomen to identify bumble bees. Male and female bumble bees differ in their color patterns. Male bumble bees can be distinguished from females by the absence of a corbicula; presence of a longer abdomen and antennae; and males do not have the ability to sting. Male bumble bees are not included in the key due to color variance and infrequent encountering. In addition, another large and regularly encountered bee that resembles a bumble bee, is a carpenter bee (*Xylocopa* spp.). Carpenter bees are included in the key because they are common in Oklahoma.



Oklahoma Cooperative Extension Fact Sheets
are also available on our website at:
extension.okstate.edu

Bumble Bee Decline

Bumble bees are among many species experiencing population declines in recent decades. Urbanization, habitat fragmentation, pesticide exposure and habitat loss contribute to bumble bee declines.

How to help bumble bees

- Reduce or eliminate the use of pesticides.
- Plant native wildflowers to provide food for native bees.
- Plant a mix of annual and perennial plants as well as plants that bloom at different times to increase availability of food.
- Reduce mowing to prevent disturbance of nests.
- Do not pick up leaves in fall. Leave them for shelter.

Have a bumble bee photo?

Researchers can use your photos to help understand the ranges, abundances and declines of bumble bee species. Upload photos to:
BumblebeeWatch.org
iNaturalist.org

Recommended websites

BugGuide.net
BumblebeeWatch.org
iNaturalist.org
Xerces.org

References

- Holm, H. (2017). *Bees: An Identification and Native Plant Foraging Guide*. Pollination Press.
- Williams, P., Thorp, R., Richardson, L., & Colla, S. (2014). *Bumble Bees of North America: An Identification Guide*. Princeton University Press.
- Wilson, J. S., & Carril, O. M. (2016). *The Bees In Your Backyard: A Guide to North America's Bees*. Princeton University Press.
- The Xerces Society, & Spivak, M. (2011). *Attracting Native Pollinators: The Xerces Society Guide, Protecting North America's Bees and Butterflies*. Storey Publishing.

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Key to Female Bumble Bees of Oklahoma

All bee illustrations by Emily Geest

Directions: Have your bee (or a photo) present for observation. Start at question 1 and answer the question by choosing one of the letters and proceed with directions until you reach a species.

Question 1: Is the abdomen shiny and hairless?

- 1a. Yes, abdomen shiny and hairless Carpenter bee (Figure 1)
 1b. No, abdomen fuzzy with hairs Go to Question 2

Question 2: Which pattern best matches the thorax? (Figure A)

- 2a. The thorax is solid yellow Morrison's bumble bee (Figure 2)
 2b. The thorax has a yellow collar Go to Question 3
 2c. The thorax has a black band Go to Question 4
 2d. The thorax has a center black spot Go to Question 5

Question 3: Is the first abdominal segment yellow? (Figure B)

- 3a. Yes, the first abdominal segment is yellow American bumble bee (Figure 3)
 3b. No, the first abdominal segment is black Black-and-gold bumble bee (Figure 4)

Question 4: Is the thorax colored white around the black band? (Figure C)

- 4a. Yes, the thorax is colored white around the black band White-shouldered bumble bee (Figure 5)
 4b. No, the thorax is colored yellow around the black band Go to Question 6

Question 5: Is the entire abdomen black? (Figure D)

- 5a. Yes, the entire abdomen is black Variable cuckoo bumble bee (Figure 6)
 5b. No, the abdomen has some yellow Go to Question 7

Question 6: Is the first abdominal segment black? (Figure E)

- 6a. Yes, the first abdominal segment is black Indiscriminate cuckoo bumble bee (Figure 7)
 6b. No, the first abdominal segment is yellow Southern plains bumble bee (Figure 8)

Question 7: Is the second abdominal segment brown? (Figure F)

- 7a. Yes, the second abdominal segment is brown Brown-belted bumble bee (Figure 9)
 7b. No, the second abdominal segment is black Common eastern bumble bee (Figure 10)
 7c. No, the second abdominal segment is yellow Go to Question 8

Question 8: Is the head entirely black? (Figure G)

- 8a. Yes, the head is entirely black Two-spotted bumble bee (Figure 11)
 8b. No, the head has some yellow hairs Half-black bumble bee (Figure 12)

Bumble bee does not match the patterns listed? You most likely have a male bumble bee which has more variable color patterns. The list of suggested resources can help identify the bee further.

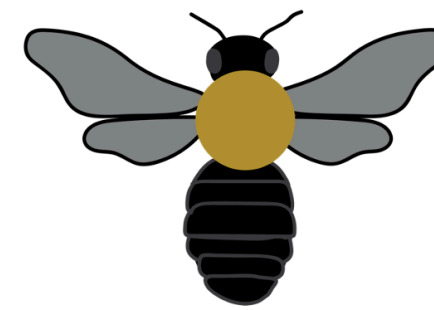
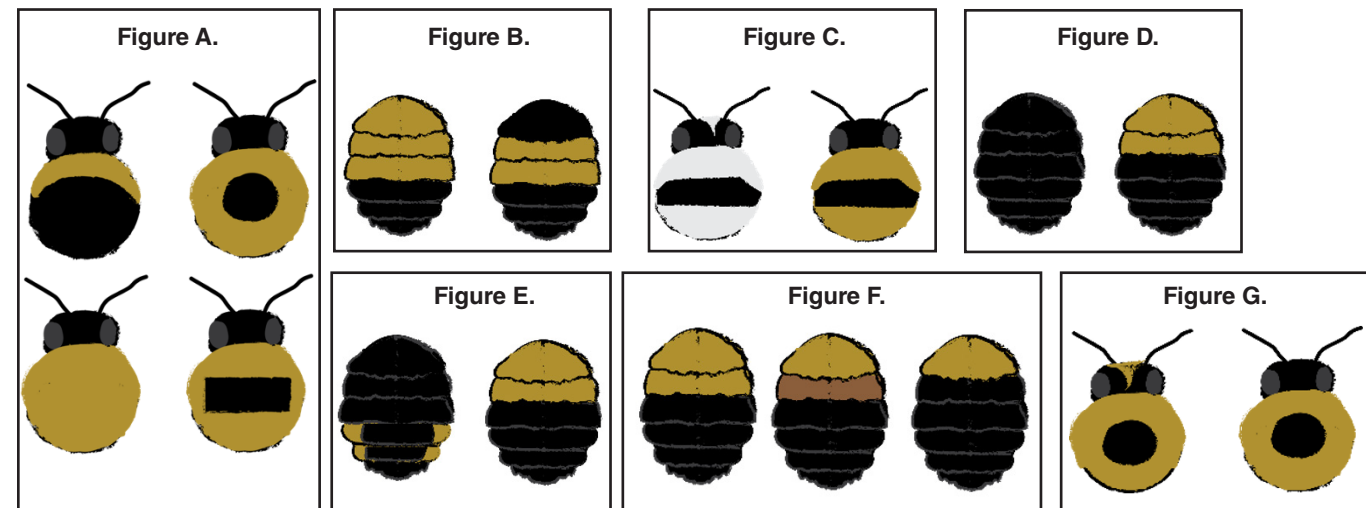


Figure 1. Eastern carpenter bee.
(*Xylocopa virginica*)

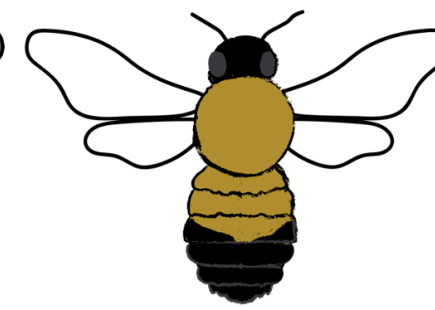


Figure 2. Morrison's bumble bee.
(*Bombus morrisoni*)

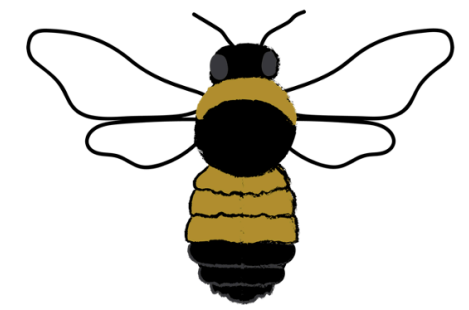


Figure 3. American bumble bee.
(*Bombus pensylvanicus*)

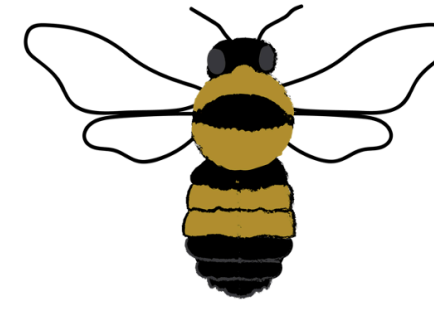


Figure 4. Black-and-gold bumble bee.
(*Bombus auricomus*)

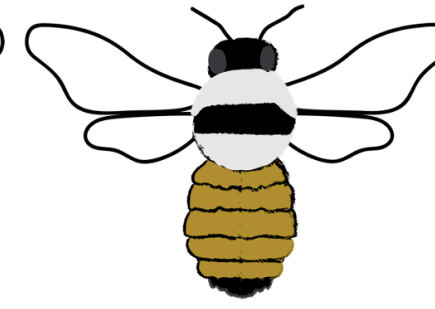


Figure 5. White-shouldered bumble bee.
(*Bombus appositus*)

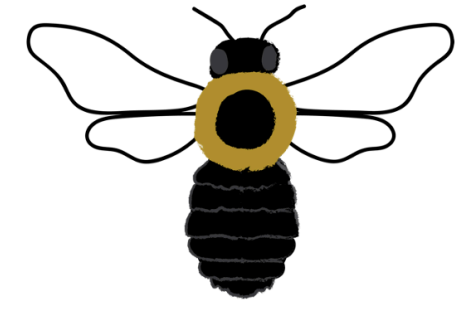


Figure 6. Variable cuckoo bumble bee.
(*Bombus variabilis*)

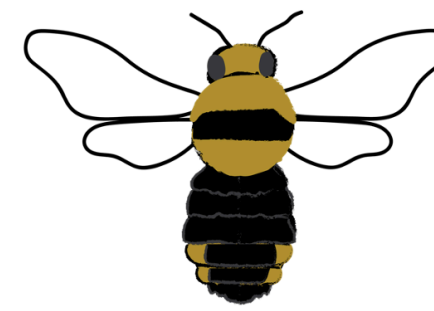


Figure 7. Indiscriminate cuckoo bumble bee.
(*Bombus insularis*)

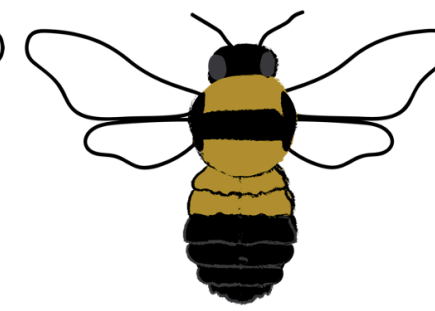


Figure 8. Southern plains bumble bee.
(*Bombus fraternus*)

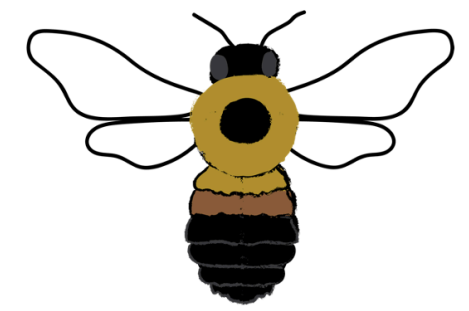


Figure 9. Brown-belted bumble bee.
(*Bombus griseocollis*)

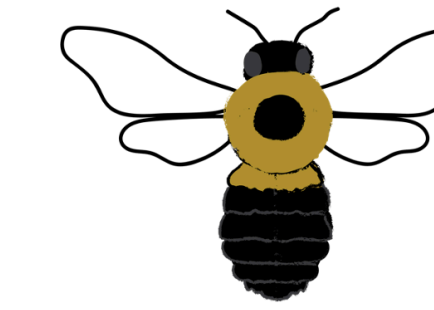


Figure 10. Common eastern bumble bee.
(*Bombus impatiens*)

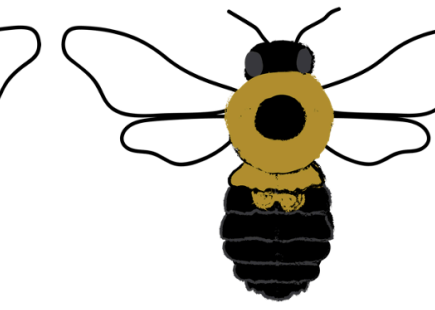


Figure 11. Two-spotted bumble bee.
(*Bombus bimaculatus*)

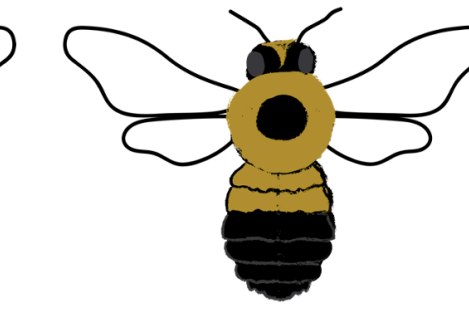


Figure 12. Half-black bumble bee.
(*Bombus vagans*)

Note: You can make this key an all-weather field guide by placing page 2 and 3 back to back and laminating it.