



# Key to Female Bumble Bees of Oklahoma

## EXTENSION

June 2021

Teri Cocke  
Graduate Student

Emily Geest  
Graduate Student

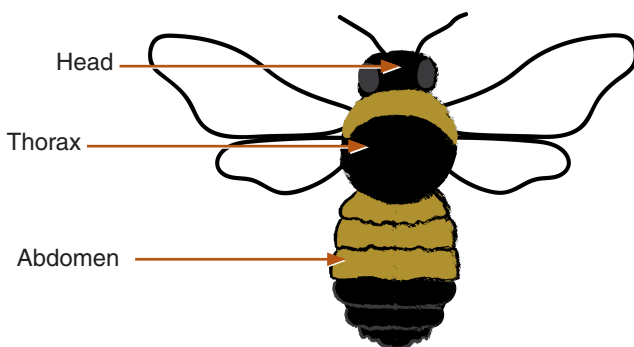
Andrine Shufan  
Associate Extension Specialist

### Bumble Bee Importance

Bumble bees (*Bombus* spp.) belong to the family Apidae, and are generalist pollinators that provide vital pollination services for horticultural and agronomical productions 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), one on each back leg, to take back to the nest. Bumble bees provide critical ecological service in the form of pollination 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, having longer abdomens and inability 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](http://extension.okstate.edu)

### Bumble Bee Decline

Bumble bees are one of 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](http://BumblebeeWatch.org)  
[iNaturalist.org](http://iNaturalist.org)

### Recommended websites

[BugGuide.net](http://BugGuide.net)  
[BumblebeeWatch.org](http://BumblebeeWatch.org)  
[iNaturalist.org](http://iNaturalist.org)  
[Xerces.org](http://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.

# 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)

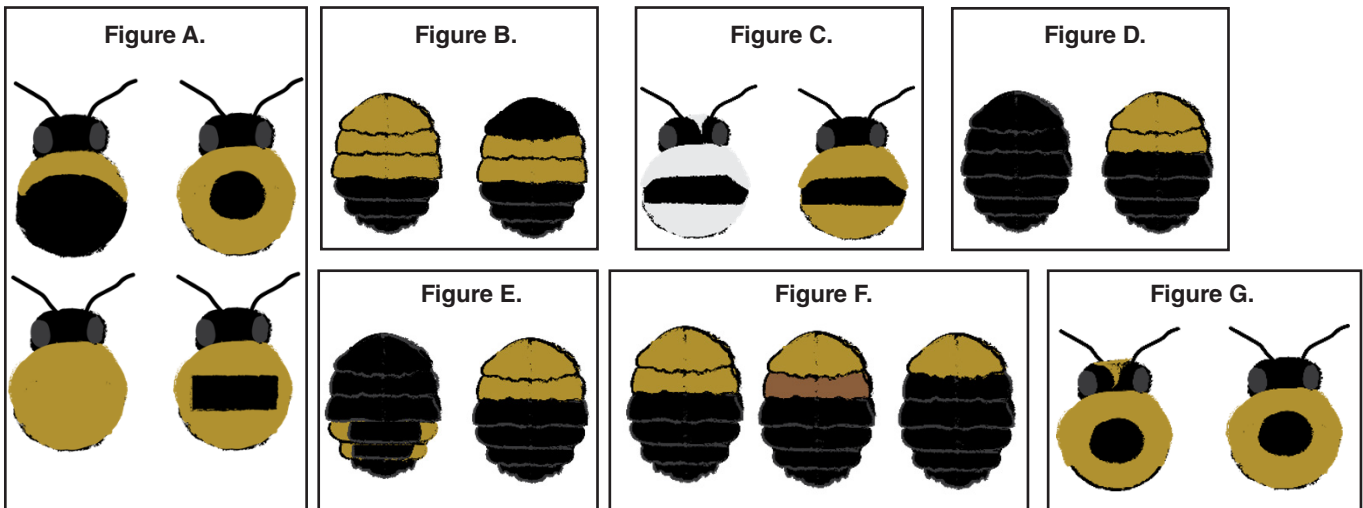
**Question 7: Is the second abdominal segment brown? (Figure F)**

- 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.*



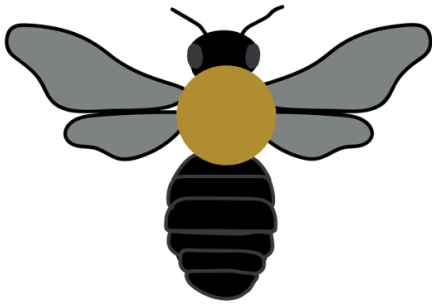


Figure 1. Eastern carpenter bee.  
(*Xylocopa virginica*)

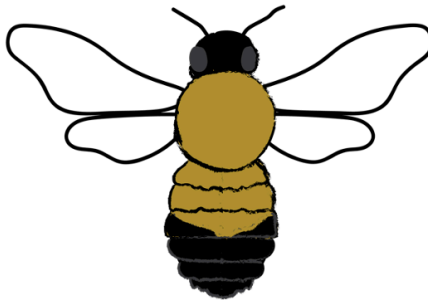


Figure 2. Morrison's bumble bee.  
(*Bombus morrisoni*)

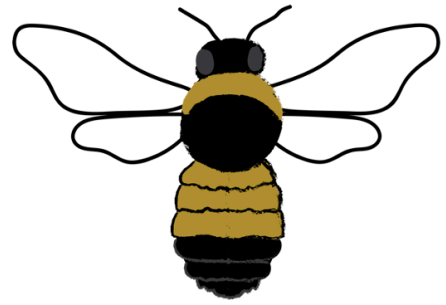


Figure 3. American bumble bee.  
(*Bombus pensylvanicus*)

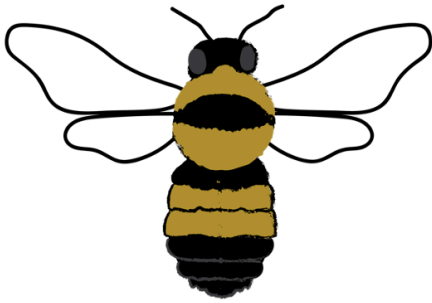


Figure 4. Black-and-gold bumble bee.  
(*Bombus auricomus*)

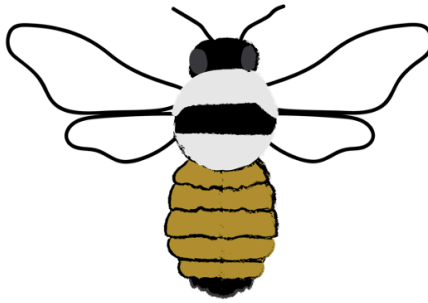


Figure 5. White-shouldered  
bumble bee.  
(*Bombus appositus*)

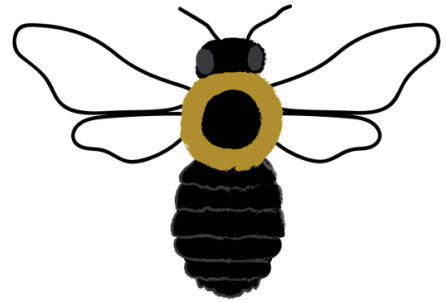


Figure 6. Variable cuckoo bumble bee.  
(*Bombus variabilis*)

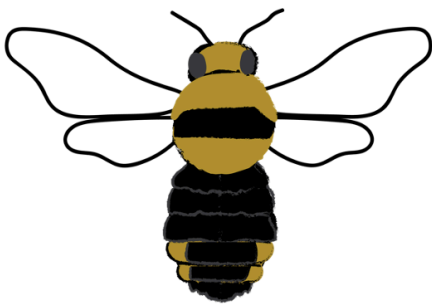


Figure 7. Indiscriminate cuckoo  
bumble bee.  
(*Bombus insularis*)

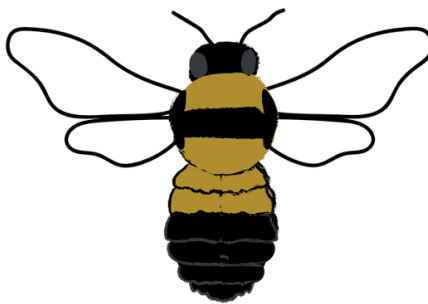


Figure 8. Southern plains  
bumble bee.  
(*Bombus fraternus*)

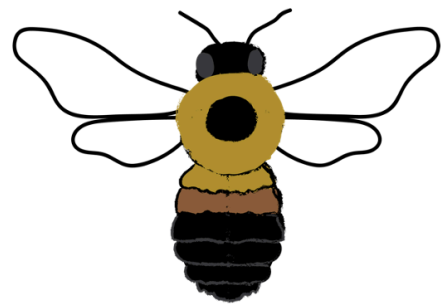


Figure 9. Brown-belted bumble bee.  
(*Bombus griseocollis*)

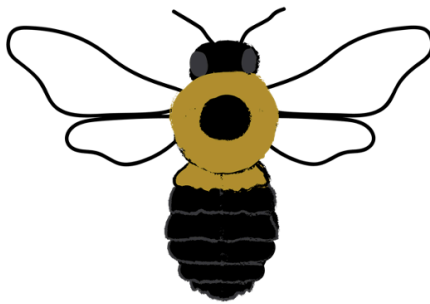


Figure 10. Common eastern  
bumble bee.  
(*Bombus impatiens*)

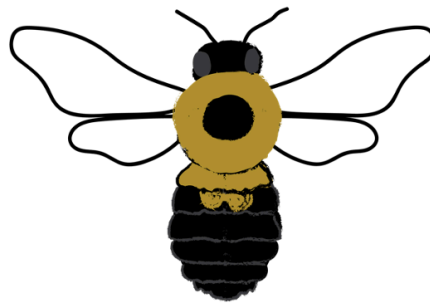


Figure 11. Two-spotted bumble bee.  
(*Bombus bimaculatus*)

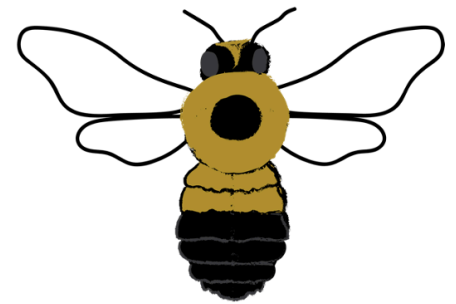


Figure 12. Half-black bumble bee.  
(*Bombus vagans*)

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

# 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 cooperatively 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.

Oklahoma State University, as an equal opportunity employer, complies with all applicable federal and state laws regarding non-discrimination and affirmative action. Oklahoma State University is committed to a policy of equal opportunity for all individuals and does not discriminate based on race, religion, age, sex, color, national origin, marital status, sexual orientation, gender identity/ expression, disability, or veteran status with regard to employment, educational programs and activities, and/or admissions. For more information, visit <https://eeo.okstate.edu>.

Issued in furtherance of Cooperative Extension work, acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture, Director of Oklahoma Cooperative Extension Service, Oklahoma State University, Stillwater, Oklahoma. This publication is printed and issued by Oklahoma State University as authorized by the Vice President for Agricultural Programs and has been prepared and distributed at a cost of 20 cents per copy. June/2021 GH.