

Honey Bee Insemination: Ergonomics

This article describes the the posture and stretches that will make working at a table more comfortable during grafting and insemination of honey bee queens.



Michael Fontaine works with a honey bee instrumental insemination rig at a microscope.

Your spine is composed of three main curves that form a slight S-shape. When these curves are properly aligned, your ears, shoulders and hips are in the same plane. Poor posture may lead to discomfort and serious injury. The following is a guide to help you avoid ergonomic-related risk factors that could result in serious musculoskeletal disorders:

General Guidelines

- Use a chair that provides good back support and sit against the back of the chair.
- Lower the chair so that your feet are flat on the floor. Use a foot rest if needed.
- Adjust the position of your work, the work surface, or the chair so that you sit in an upright, supported position.
- Keep your shoulders, arms and hands relaxed. Be aware of tensions that may occur as you perform different tasks.
- Avoid excessive reaching to use instruments and work materials.
- Maintain neutral wrist and arm postures when working; work with your wrists in a neutral position (Image 2).
- Avoid static positions. Vary activities, change position, and take short breaks/stretch every 30–60 minutes to reduce the effects of postural stress.
- When lifting materials from the ground, keep your back straight during the lift, bending at the knees, keeping the load close and centered in front of you, while looking forward (Image 3). Always assess the load prior to lifting it. Get help if needed.



Image 2. A wrist in a neutral position.



Image 3. Lifting a box with a straight back and bent knees.

Microscope Use

- Sit close to the work surface.
- Avoid leaning on hard edges.
- Pad forearms and edges.
- Keep elbows close to your sides.
- Adjust chair, workbench, or microscope as needed to maintain an upright head position.
- Elevate or move the microscope close to the edge of the counter to avoid a forward head posture (Image 4).

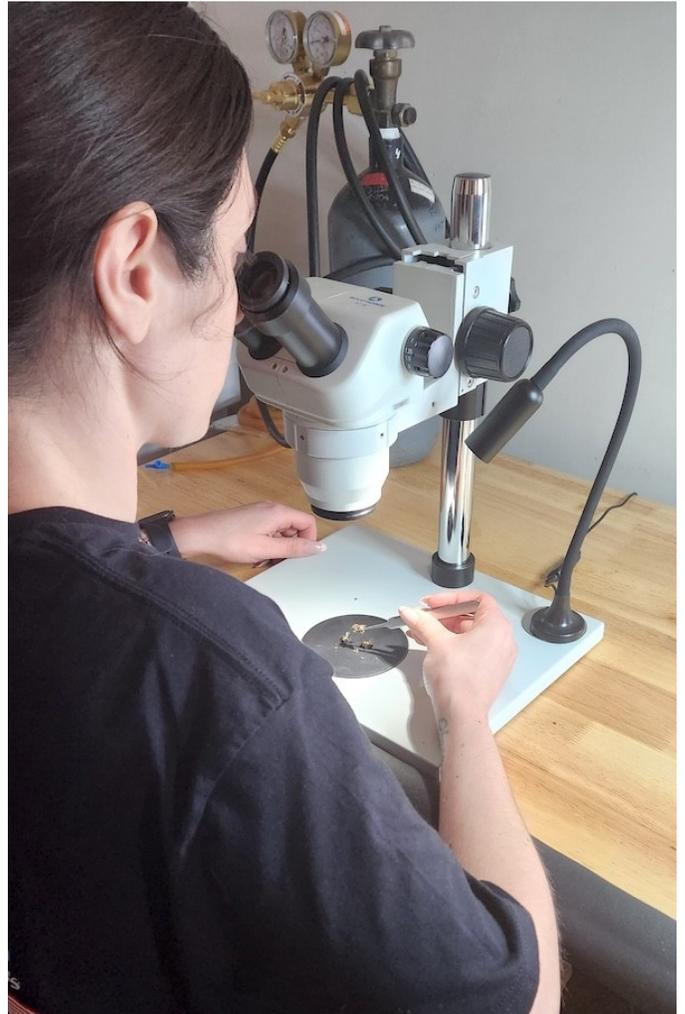


Image 4. Looking into a microscope with proper positioning of the head and neck.

- Take short breaks. Every 15 minutes, close your eyes or focus on something in the distance. Every 30–60 minutes, get up to stretch and move.

Grafting

- Use an adjustable frame holder to properly position the frame while grafting, similar to adjusting a computer monitor at your desk. Frame holders can be purchased online or made from scraps of wood.
- Position the grafting frame so that your viewing distance is approximately 20 inches.
- The top of the frame should be at eye level with a slight backward tilt. This will allow your eyes to gravitate naturally toward the center of the grafting frame (Image 5).



Image 5. A grafting stand with a frame in the proper position.

Exercises and Stretches

The following exercises are helpful in reducing the effects of postural stress that is associated with microscope work and grafting. Repeat every 60 minutes.

Standing Back Extension

Hands on the hips, keeping your gaze forward, gently press your hips forward to tolerance (hold 5 seconds) and return to neutral spinal position (Image 6). Repeat five times.

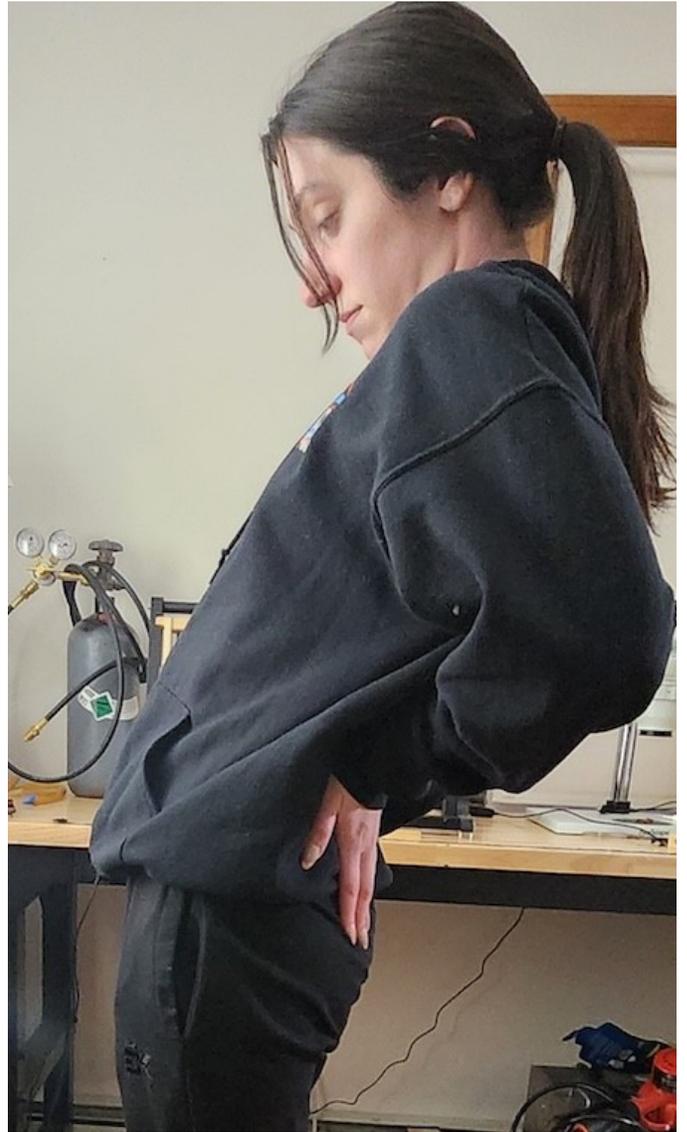


Image 6. The standing back extension

Neck Extension Stretch

Tilt your head upwards (hold 5 seconds), then return back to looking straight ahead (Image 7). Repeat five times.



Image 7. Neck extension stretch

Chin Tuck

Slowly draw your head back so that your ears line up with your shoulders (Image 8). Hold for 5 seconds. Repeat five times.



Image 8. The chin tuck A. start B. finish

While sitting in a chair, hold the seat with one hand and place your other hand on your head to assist in bending your head to the side as shown (Image 9). Bend your head towards the opposite side of the hand that is holding the chair seat. You should feel a stretch to the side of your neck. Hold the stretch for 5 seconds. Repeat five times on both sides.



Image 9. Upper Trap Stretch A. start B. finish.

Extensor Stretch

Straighten arm at shoulder level in front of you with palm toward floor (Image 10A). With opposite hand, gently pull your hand down until stretch is felt on top of arm. Hold 5 seconds. Repeat five times.

Flexor Stretch

Straighten arm at shoulder level in front of you with palm toward the floor (Image 10B). With opposite hand, gently pull your hand upward until stretch is felt on the bottom of arm. Hold 5 seconds. Repeat five times.

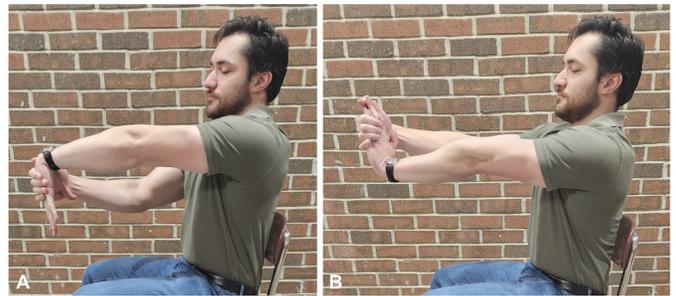


Image 10. Extensor stretch. A. Top of arm B. Bottom of arm

Note: Always consult your physician before beginning any exercise program. This general information is not intended to diagnose any medical condition or to replace your healthcare professional. If you experience any pain or difficulty with these exercises, stop and consult your healthcare provider.

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Authors

Robyn Underwood, Ph.D.

Extension Educator, Apiculture

rmu1@psu.edu

484-268-5208

Kate Anton

Research Technologist

kxa138@psu.edu

814-865-9806

Michael Fontaine

wildbrookhoney@gmail.com

extension.psu.edu

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