Beekeeping Assistive Technology

Ned Stoller
Agricultural Engineer, ATP

AgrAbility Virtual National Training Workshop
Thursday, January 25, 3:00 p.m. ET
Basic Webinar Instructions

- Audio available through computer or phone.
- Check sound via Communicate menu at top left.
- Closed captions: use arrow to expand or contact the Media Viewer window. You may have to enter some log-in information.
- Expand/contract any of the windows in the right-hand column with the arrows. May need to do this to see video of presenter.
- Expand/contract the size of the right-hand column.
Basic Webinar Instructions

Questions and comments

○ Click Chat icon at top right of screen (it should turn blue). Enter message in box, choose who to send it to, and click send. You may enter questions about the presentation at any time. Please send to “All Panelists”.

○ In addition, during the Q & A period, if you have a web microphone, click the “Raise Hand” icon to indicate that you have a question. We will enable your microphone or phone connection.
Basic Webinar Instructions

- You won’t be able to see the entire attendee list
- Please let me know if more than one person is viewing at your computer
- 4 quick survey questions + opportunity to share comments
- Session recorded and archived with PowerPoint files at www.agrability.org/Online-Training
- Problems: use chat window or email jonesp@purdue.edu
AgrAbility: USDA-sponsored program that assists farmers, ranchers, and other agricultural workers with disabilities.

- Partners land-grant universities with disability services organizations. Currently 20 state projects
- National AgrAbility Project: Led by Purdue’s Breaking New Ground Resource Center. Partners include:
  - Goodwill of the Finger Lakes
  - APRIL (Association of Programs for Rural Independent Living
  - Colorado State University
  - Washington State University

- More information available at [www.agrability.org](http://www.agrability.org)
Beekeeping Assistive Technology

Ned Stoller, Agricultural Engineer, ATP
Michigan AgrAbility

Michigan AgrAbility is a non-profit that helps farmers with serious medical conditions to keep working. We are a partnership between Michigan State University Extension and Easterseals Michigan.
Assistive Technology

An item or a system that improves the functional capabilities of a person with a disability.
Sideline Beekeeping

- Sideline apiaries with 20 to 200 beehives produce honey and provide pollination services.
- An average work week in spring, summer, and fall could be 20-40 hours per week.
- Up to $100,000 annual revenue from 200 hives
- Revenue comes from:
  - renting out pollination hives,
  - hive shares
    - [https://bearcreekorganicfarm.com/pages/adopt-a-hive](https://bearcreekorganicfarm.com/pages/adopt-a-hive),
  - selling honey products at on-farm stores, farmer markets, local retail outlets, or online.
Beekeeping Terms

Frames (8 or 10 per hive body)

Hive Body (supers, boxes)
- Shallow
- Medium
- Deep

Hive – stacks of hive bodies which are filled with frames

Cover

Entrance & Bottom Board
Successful Beekeepers

- Successful beekeepers inspect their hives regularly for bee health, pests, feeding, and honey production.
- Functional activities include:
  - mobility across rough terrain to access the hives,
  - lifting and unstacking the hive bodies (weighing up to 90-pounds), and
  - gripping, prying, and pulling out frames.
Physical Challenges

- Common beekeepers’ medical conditions include arthritis, back injury, carpal tunnel syndrome, and musculoskeletal injury
- Impaired activities are mobility to the hives, bending over to inspect frames, lifting hive bodies, grasping frames, moving hives, gripping hand tools
## Summary

<table>
<thead>
<tr>
<th>Farmsite Recommendation</th>
<th>Estimated Cost</th>
<th>Frequency</th>
<th>Longevity</th>
</tr>
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<tbody>
<tr>
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Ergonomics
Ergonomics

- Rest at regular intervals & sit on a stool.
- Alternate repetitive, awkward, & strenuous tasks.
- Use proper workstation height.
- Keep commonly used items within 17 inches of the worker’s body.
Lighten the Load:
8-Frame and Shallow Hive Bodies

http://www.bushfarms.com/beeseightframemedium.htm
Whole Hive Moving

Hand-hold dollies such as this one from MannLakeLtd.com lift from the sides of the hive bodies. Item #MH-105.

This hand truck from HandTrucksRus.com would move whole hives.
Individual Hive Body Lifts: 2-Person Carrier

The two-person hive carrier is a low-cost accommodation that divides the weight in half. It is item #935C at BrushyMountainBeeFarm.com.
Individual Hive Body Lifts - Kaptar

https://www.countryfields.ca/products/kaptar-lift-electric
Individual Hive Body Lifts: DIY

https://www.youtube.com/playlist?list=PLVvPW9G-alYgPxttbrmLemQwm8W4jC1LLP
Individual Hive Body Lifts: Cranes

https://www.northerntool.com Item# 52837
Individual Hive Body Lifts

A crane option for hive-lifting tongs could be to modify an EZ Dual Changer from BiermanSales.com. Their item #51 costs $360.
Hand Tools
Hand Tools

http://disabilityworktools.com/gripeeze-heavy-duty-trade-glove/ $35

https://www.shizeltool.com/beekeeping $25

Hand Tools
Bee Yard Mobility

http://volusiabeekeepers.org ~$250
http://www.greenhousemegastore.com/product/5902

http://burghbees.com/ ~$800
Bee Yard Mobility

~$3000
Beehive Access
Beehive Access

www.Amazon.com item# B00870EJJS
www.NorthernTool.com item# 143666
$2200
Workshop

- Heat
- Seat
- Table
- Floor
- Ergonomics!
Workshop
Workshop
GlobalIndustrial.com sells an ergonomic workbench and tool balancer to support heavy tools. It is item #wg249497.
Honey Room

https://www.dadant.com


https://www.betterbee.com
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Conclusion

Assistive technology in the apiary will increase the likelihood of success for a beekeeper with medical impairments. Beekeeping is a very satisfying enterprise, and can be done by workers with medical impairments. Modified tools and equipment enable tasks that would otherwise be impossible or unhealthy for the worker.
Thank you!

Ned Stoller

Agricultural Engineer &
Assistive Technology Specialist

www.MichiganAgrAbility.org