

Microscopes for Insect and Mite Identification

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Why is a magnifying device useful to a greenhouse grower? Some reasons:

- Better pest identification - to species
- Determine the lifestage of a pest for pesticide application timing
- Tell if plant damage is caused by a pest insect or mite, and/or which one?
- Tell if a pesticide application killed all the pests, and/or all the pest lifestages
- Are beneficial insects and mites alive in a new biocontrol shipment?
- Check if beneficial nematodes are viable prior to application
- Is that bug on my plants a pest or a beneficial?
- Take closeup photos to send to a diagnostician, or share for co-worker training

This handout is far from a complete list of magnification options for greenhouse pest scouting and identification, but it should give you a place to start. More than one of these options may be useful to you for various reasons.

Handlenses (at least 10X magnification); hands-free visor magnifiers:

Very portable and inexpensive, *every grower should have and use one regularly*

Smartphone magnifier:

iPhone magnifier turns your iPhone into a zoom-able magnifying glass

<https://support.apple.com/en-us/HT209517>

Android options: <https://www.lifewire.com/best-magnifying-glass-apps-4691722>

Clip-on lenses for smart phones:

For example: <https://www.amazon.com/CamKix-Universal-Camera-Smartphones-including/dp/B00FDLNR7E>

Handheld digital microscopes – search Amazon: \$25-\$200

<https://www.amazon.com/handheld-digital-microscope/s?k=handheld+digital+microscope>

Can be inexpensive yet provide clear closeup images

Usually can record photos and videos on your phone or tablet

WiFi-capable models are extremely portable – just the small handheld camera and your phone/tablet in the greenhouse. Sanderson's example displayed cost \$30:

https://www.amazon.com/Microscope-Magnification-Inspection-Compatible-Smartphone/dp/B07PVMRZQH/ref=sr_1_3?keywords=handheld+digital+microscope&qid=1658775122&sr=8-3

USB-connected models can project onto phone, tablet, or computer screen; nearly as portable as WiFi models but are connected by a USB cable.

DinoLite handheld digital microscope

Look and work similarly to other handheld digital microscopes, but are very high quality. USB cable needed but can connect to phones, tablets, or computers for photo and video captures. Webinar by The Buglady Suzanne Wainwright-Evans, and Kerie Roark of DinoLite, on DinoLite digital microscopes: <https://www.youtube.com/watch?v=HovtV-merm8>

DinoLite search on Amazon: \$399+

<https://www.amazon.com/Dino-Lite-AM4113T-Handheld-Microscope-Measurement/dp/B00MQ5KU7U>

DinoLite (new) on eBay: \$150-\$500

https://www.ebay.com/b/Dino-Lite-Digital-Microscope-Microscopes/185223/bn_7109887982?mkevt=1&mkcid=1&mkrid=711-53200-19255-0&campid=5337590774&customid=&toolid=10001

Aluminum base stand for handheld digital microscopes \$22

<https://jiusion.com/products/adjustable-professional-base-stand-holder-desktop-support-bracket-for-33-35cm-in-diameter-for-usb-digital-microscope-camera>

Inexpensive but sturdy stand to hold most handheld digital microscopes for hands-free, stable image capture.

Used binocular dissecting microscopes (aka stereomicroscopes)

Not easily portable in a greenhouse, but can provide clear images at several magnifications on a stable base at a desk. May need a supplemental light source; inexpensive LED desk lamps work well, and portable rechargeable desk lamps are available.

Good article by Dan Gilrein on stereomicroscopes for growers:

<https://e-gro.org/pdf/2022-11-21.pdf>

Dealers of used equipment may have refurbished scopes from schools or labs, or relatively inexpensive new units can be purchased.

Example binocular dissecting microscopes: \$150+

https://microscopecentral.com/collections/used-microscopes/head-type_binocular
<https://microscopeinternational.com/refurbished-stereo-microscopes/>

Binocular dissecting microscope search on eBay: \$100+

https://www.ebay.com/b/Stereo-Microscopes/185223/bn_115028352?campid=5337590774&mkcid=1&mkrid=711-53200-19255-0&toolid=10001&rt=nc&mag=1

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