

Melon Trait and Germplasm Resources Survey 2011

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The Cucurbit Crop Germplasm Committee (CCGC), which operates under the auspices of the USDA-ARS National Plant Germplasm System (NPGS), is composed of ARS, university and industry scientists, and provides guidance to NPGS on matters relating to cucurbit crop and wild related species. The CCGC is responsible for all cultivated cucurbits (<http://www.ars-grin.gov/npgs/cgclist.html>).

The CCGC Crop Report is available on-line and is periodically updated. The seed industry and public research communities have undergone major changes since the last update of the melon (*Cucumis melo* L.) section of the CCGC Crop Report. Moreover, changes in market demands and resource and regulatory constraints, further development of molecular technologies, and new production-limiting biotic and abiotic challenges warrant an update of the melon report.

Melon was introduced to North America after centuries of culture and selection throughout Europe, the Middle East, central, eastern and southern Asia, India, and Africa. Recent research supports an Asian origin (1-3) and reports the closest wild species, *C. picrocarpus*, to be in Australia (3).

A two-part survey instrument is, thus, available for input by any person in any country with knowledgeable interest in melon production, utilization, breeding, genetics, or botany (see following). Part 1 is concerned with fruit and plant traits of importance with emphasis on host plant resistance, fungal and viral pathogens in particular. Every region has specific, required combina-

tions of fruit quality traits—they are not included. Part 2 is focused on Germplasm Resources, from “Germplasm,” which consists of wild or feral accessions and land races, to varieties and cultivars including F₁ hybrids, and nine types of genetic stocks. Interest in markers and transgenics are also queried.

Download the survey from the website at the bottom of the survey and send via email, or photocopy and send via mail (address above), or fax to the number at the bottom of the survey. All responses will be useful for updating the melon section of the CCGC Crop Report. A summary of the survey will be prepared for inclusion in the next Cucurbit Genetics Cooperative Report.

Literature Cited

1. Renner, S. S., Schaefer, H., and Kocyan, A. 2007. Phylogenetics of *Cucumis* (Cucurbitaceae): *C. sativus* (cucumber) belongs in an Asian/Australian clade far from *C. melo* (melon). *BMC Evolut. Biol.* 7:58-69.
2. Schaefer, H., Heibl, C., and Renner, S. S. 2009. Gourds afloat: a dated phylogeny reveals an Asian origin of the gourd family (Cucurbitaceae) and numerous oversea dispersal events. *Proc. Royal Soc. Bot.* 276:843-851.
3. Sebastian, P., Schaefer, H., Telford, I. R. H., and Renner, S. S. 2010. Cucumber (*Cucumis sativus*) and melon (*C. melo*) have numerous wild relatives in Asia and Australia, and the sister species of melon is from Australia. *Proc. Natl. Acad. Sci. (U.S.A.)* 107(32):14269-14273.

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Melon Survey 2011 Part 1: Fruit and Plant Traits of Interest/Needed

Fruit traits

- Increased shelf life
- Lightly processed characteristics
- Increased yield
- Nutritional value
- New market types
- Other: _____
- Other: _____

Abiotic stress

- Temperature
- Salt excess
- Mineral deficiency
- Water
- Other: _____
- Other: _____

Disease: Fungal

- Powdery mildew
 - Podosphaera xanthii*
 - Golovinomyces cichoracearum*
- Downy mildew (*Pseudoperonospora cubensis*)
- Anthracnose (*Colletotrichum lagenarium*)
- Fusarium wilt (*Fusarium oxysporum* f.sp. *melonis*)
- Verticillium wilt (*Verticillium dahliae* and *V. albo-atrum*)
- Phytophthora crown rot (*Phytophthora capsici*)
- Pythium (*Pythium* spp.) root and crown rot
- Alternaria (*Alternaria cucumerina*)
- Gummy stem blight (*Didymella bryoniae*)
- Vine decline (*Monosporascus cannonballus*)
- Other: _____
- Other: _____

Disease: Bacterial

- Fruit Blotch (*Acidovorax avenae* subsp. *citrulli*)
- Bacterial wilt (*Erwinia tracheiphila*)
- Angular leaf spot (*Pseudomonas syringae* pv. *lachrymans*)
- Other: _____
- Other: _____

Disease: Viral

- Aphid-transmitted
 - Cucumber mosaic virus (CMV)
 - Cucurbit aphid borne yellows virus (CaBYV)
 - Muskmelon yellow stunt virus (MYSV)
 - Papaya ringspot virus (PRSV) watermelon strain (= WMV 1)
 - Watermelon mosaic virus (WMV) (= WMV 2)
 - Watermelon mosaic Virus-Morocco
 - Zucchini yellow mosaic virus (ZYMV)

Disease: Viral (continued)

- Whitefly-transmitted
 - Beet pseudo yellows virus (BPSYV)
 - Cucurbit leaf crumple virus (CuLCrV)
 - Cucurbit yellow stunting disorder virus (CYSDV)
 - Lettuce infectious yellows virus (LIYV)
 - Melon chlorotic leaf curl virus (MCLCV)
 - Melon leaf curl virus (MLCV)
 - Squash leaf curl virus (SLCV)
 - Watermelon curly mottle virus (WCMoV)
 - Other: _____
 - Other: _____

Soil-borne/ Seed-borne

- Muskmelon necrotic spot virus (MNSV)
- Squash mosaic virus (SqMV)
- Other: _____
- Other: _____

Other

- Cucumber green mottle mosaic (CGMMV)
- Cucumber vein yellowing virus (CVYV)
- Cucurbit latent virus (CLV)
- Curly top virus
- Eggplant mottled dwarf rhabdovirus
- Kyuri green mottle mosaic virus (KGMMV-YM)
- Melon rugose mosaic virus (MRMV)
- Melon vein-banding mosaic virus (MVbMV)
- Melon yellow spot virus
- Melon yellowing-associated virus (MYaV)
- Melon yellows virus
- Muskmelon yellow spot virus (MYSV)
- Ourmia melon virus
- Tobacco ringspot virus (TrSV)
- Tomato leaf curl virus
- Zucchini yellow fleck virus (ZYFV)
- Other: _____
- Other: _____

Insects and Nematodes

- Sweetpotato whitefly, *Bemisia tabaci* Biotypes: A/B/Q
- Greenhouse whitefly, *Trialeurodes vaporariorum*
- Cucumber beetle, *Acalymma trivittatum*, *Diabrotica undecimpunctata undecimpunctata*, and *D. balteata*
- Leafminer, *Liriomyza sativae* and *Liriomyza trifolii*
- Green peach aphid, *Myzus persicae*
- Melon aphid, *Aphis gossypii*
- Melon fly, *Myiopardalis pardalina*
- Root knot nematode, *Meloidogyne* spp.
- Other: _____
- Other: _____

Download from: http://www.ars-grin.gov/npgs/cgc_reports/melonsurvey

Return to: Jim McCreight, USDA, ARS, 1636 E. Alisal St., Salinas, CA 93905, U.S.A.
Fax 01-831-755-2814; Email: jim.mccreight@ars.usda.gov

Melon Survey 2011 Part 2: Germplasm Resources

Germplasm

More germplasm is needed for various characters (as listed on the preceding page).

Germplasm exploration and exchange is:

- high priority
 moderate priority
 low priority

If high or moderate priority, please identify potential countries and areas therein as well as names of in-country contacts who could collaborate in germplasm collection trips or /exchanges.

There are adequate germplasm resources available.

Comments on germplasm resources:

Genetic Stocks of interest

- Recombinant inbred lines (RILs)
 Near isogenic lines (NILs)
 Core Collections
 Test Arrays
 Mutant Stocks
 Pocket Collections
 Haploids
 Doubled Haploids
 Tetraploids

Transgenics *at present* are

- high priority
 moderate priority
 low priority

Transgenics *in the future* are

- high priority
 moderate priority
 low priority

Molecular markers are

- high priority
 moderate priority
 low priority

Additional comments

Respondent information (optional, but helpful for any needed clarification)

Name:

Discipline area(s):

Contact information:

Breeding

Molecular

Pathology

Physiology

Entomology

Other _____

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