

Observations on sac Plants in the Field and Greenhouse November 2004 to May 2005

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-All of the original sac plants died over winter in the field, but they were cloned by shoot cuttings and preserved in the GH.

-The sac X alfalfa materials planted in the field in the summer of 2004 were partly to completely winterkilled, but so were some alfalfa cultivars. Are the survivors merely escapes or will they be useful in breeding? Time will tell.

-The sac plants in the winter GH expressed unprecedented heterosis for size of leaves, flowers, and plants (see an earlier report on flower size). At this time it appears that the summer-dormant, winter-active nature of *M. arborea* is involved. These results suggest observing the sac materials in regions of the world where non-dormant alfalfa is grown, and samples have been sent to Australia, Italy, and California.

New crosses between alfalfa male steriles and *M. arborea* were made using pollen of single *M. arborea* genotypes. Flowering was sparse on all but one *M. arborea* genotype, but some seed was produced.

Almost every sac plant had an occasional sectored flower (see the report by Haas containing pictures and interpretations of sectors).

The direction of pod coiling was observed on all *Medicago* materials in the GH over the winter. Most *Medicago* species coil counterclockwise from the base, but clockwise and counterclockwise coiling occurs in *M. truncatula*, and the direction of coiling is under genetic control. Interestingly, three *M. arborea* genotypes occasionally had a pod that coiled clockwise from the base, whereas most of the pods coiled counterclockwise. Sense of pod coiling in *M. arborea* appears to be on a threshold and can proceed in either direction under conditions in the winter GH at Madison, WI. See figure below for *M. arborea* pods coiling in both directions.

Additional information will be posted as it is obtained.

