Update on 'Alborea': A new cultigen developed from hybrids of Alfalfa X M. arborea.

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The first hybrids were obtained 10 years ago, and have been used in various studies (refs. below). Hybrids and hybrid derivatives have been used in two mating strategies: 1. Crossing with alfalfa for breeding purposes, and 2. Intercrossing hybrids in a partial diallel to pyramid selected M. arborea traits, and produce new Medicago lines. As we progressed through generations of breeding and selection, it became clear that the material needed an identifying name for ease of recording and reporting. Alfalfa and M. arborea were abbreviated and combined for the name Alborea.

Alborea is a generic name for the cultigen, and a suffix is added to identify lines bred for special characteristics. Thus, Alborea-YS stands for Yellow-flowered Synthetic, and Alborea-P/Y indicates variegated flower color due to co-expression of Purple from alfalfa, and Yellow from M. arborea (Fig. 1). Other lines in development include: 'large seed', 'arborea leaf', 'winter active', and traits such as woodiness and shrubiness.

Alborea-YS was completed first, and field evaluations will be reported as they become available. In the meantime, the following has been observed in nurseries at Madison, WI. The biomass yield of Alborea in two cuttings in the seedling year, in a microplot test with three replications, was slightly better than the checks, including non-dormant Sequel (AU), and dormant Vernal (WI). Recovery after cutting was less than Sequel and more than Vernal. Winter survival of Alborea-YS is 40-50%, versus Vernal near 100%, and Sequel about 5%.

Alborea seed production is comparable to alfalfa with hand pollination, but less with bee pollination in competition with alfalfa. Seed size of individual plants varies from slightly larger than alfalfa to slightly smaller than M. arborea. Seed yield and seed size are being increased by selection. In the glasshouse and field, some Alborea selections have demonstrated improved seedling vigour over the alfalfa checks.

In 2013 we reported a total of 32 hybrids of alfalfa X M. arborea (3). Since that time, additional hybrids have been produced in Queensland and Wisconsin, involving new M. arborea parents. Thus, the genetic base of introgressions from M. arborea is increasing, and used in Alborea lines, and in breeding strategies with alfalfa.

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Fig. 1. Left: Examples of yellow flowers of Alborea-YS.

Right: Examples of yellow and purple coexpression in flowers of Alborea-P/V. These flowers are often called variegated, and may be highly variable.