

Intra- and interspecific crosses in *macrotyloma* (papilionaceae)

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Macrotyloma is an African/Asian genus of about 25 species (1). Three are discussed below:

M. uniflorum (horse gram) is an important hardy pulse crop in southern India where production has been estimated to be about 377 000 tonnes/year (2). A cultivar (Leichhardt) has been released for commercial use in Australia (3). African wild forms are var. *stenocarpum*, *verrucosum* and *benadirianum* (1). A form native to north Queensland is morphologically close to *stenocarpum*.

M. africanum is a fine, twining plant which seems to have much better tolerance of impeded soil drainage than other *Macrotyloma* spp. observed (unpublished data).

M. axillare has been domesticated in Queensland where cv. Archer is used as a hardy, sown pasture legume exhibiting good drought tolerance and early spring growth (3).

These inbreeding species possess a number of characters which could be usefully combined (see table for an indicative list). As they have not only a strong morphological resemblance but also a common chromosome number ($2n = 20$) and close karyotypic similarity (4), it may well prove possible to transfer genes from one to another.

	<i>M. uniflorum</i>		<i>M. axillare</i>	<i>M. africanum</i>
	Horse gram	Wild types		
Life cycle	annual	annual	perennial	annual
Drought tolerance	good	good	excellent	good
Water logging	susceptible	susceptible	susceptible	tolerant
Powdery mildew	susceptible	susc./tol.	resistant	susceptible
Pod shattering	no	yes	yes	yes
Hard-seededness	no	yes	yes	yes

To date, crosses have been attempted in a crude humidity chamber used to maintain "100%" R.H. about the plant for 15 to 24 h after late afternoon (5.30 to 6.30 p.m.) emasculation of expanded buds and immediate pollination with freshly dehisced pollen:

uniflorum var. *stenocarpum* x var. *uniflorum*, and reciprocals - F_1 fully fertile, subsequent generations segregate for many traits.

M. uniflorum var. *stenocarpum* x *M. africanum*, and reciprocals - F_1 vigorous and flowers profusely, but only very rarely do flowers form seeds.

M. axillare x *M. uniflorum* (native Australian form) - putative F_1 vigorous and morphologically very similar to the maternal parent. F_1 origin postulated because (i) the plant was slightly susceptible to powdery mildew whereas *M. axillare* is resistant; and (ii) though it flowered profusely, it failed to set seed under conditions where the maternal parent was fully fertile.

Thus, characters may be readily interchanged between wild and cultivated forms of *M. uniflorum*; but the interspecific crosses may require at least slightly more sophisticated techniques, or choice of other parents.

1. Verdcourt, B. 1970. Kew Bulletin 24: 379-447.

2. Kay, Daisy E. 1979. "Food Legumes". (Trop. Products Inst.: London.)

3. Barnard, C. 1972. "Register of Australian Herbage Plant Cultivars". (CSIRO: Canberra.)
4. A Marechal, R. and Otoul, E. 1966. Bull. Jard. Bot. Etat Brux. 36: 325-333.