Effect of time of sowing on the establishaent and development of surface-sown phalaris aquatica

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To replace nitrophilous weeds on non-arable land it is necessary to apply herbicides after the autumn break and then sow pasture seed (1). This means sowing can take place between April and September. As *Phalaris aquatica* is one of the most effective species for controlling these weeds (2), experiments were undertaken to ascertain the effect of time of sowing on its establishment and development.

Methods

The experiments were near Orange on a site with an average annual rainfall of 726 mm and an altitude of 600 m. The nitrophilous weeds were mainly thistles and annual grasses. Seed of *P.* aquatica cv. Sirosa (3 kg/ha) was broadcast on the soil surface with superphosphate (200 kg/ha) on four occasions in each of 1977 and 1978 (table 1); herbicides (2,2-DPA + amitrole) were applied before each sowing. Seed was treated to reduce losses due to ants. Each experiment had four replications. Establishment and development of *P.* aquatica was recorded respectively by counting the number of plants present three months after sowing and measuring the percentage ground cover in August 1981.

Results and Discussion

Establishment in both years was higher from the earlier sowings than from the late sowing and this was reflected in percentage ground cover of *P.* aquatica three and four years later (table 1). Results for establishment were achieved during years of low and high rainfall (1977, 587 mm; 1978, 1015 mm) and results for development during years of low rainfall (1979, 423 mm; 1980, 483 mm; 1981, 478 mm). Sowing in May, June or July subjects the establishing seedlings to less desiccation than sowing in August or September (3) and allows more time for the plants to develop and thus survive the following summer (4). At lower altitudes these factors become more important and thus sowing should not be later than June. Conversely, at higher altitudes, sowing could take place as late as August or September.

Table 1. Effect of time of sowing on establishment and development of *P.* aquatica.

Time of sowing	Establishment. Estab. of viable seed %	Rain in the 5 wk after sowing mm	days	Development. Ground cover in Aug. 1981 %
May 2, 1977	7.2 a[+]	154	15	9.2 a
June 6, 1977	4.7 a	71	6	3.5 b
July 19, 1977	7.0 a	42	7	10.7 a
Aug 26, 1977	1.1 b	50	8	0
May 12, June 7, 1978[†]	48 a	90	18	26 a
June 7, July 11, 1978	45 a	84	20	32 a
July 11, Aug 29, 1978	45 a	63	13	31 a
Aug 29, Sept 20, 1978	18 b	118	11	15 b

† Half the total amount of seed sown on each date.
+ Within columns values not followed by a common letter differ ($P < 0.05$).

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3. Campbell, M.H. and Swain, F.G. 1973. J. Range Mgmt. 26: 355-359.

4. Hoen, K. 1968. Aust. J. Exp. Agric. Anim. Husb. 8: 190-196.