# Stylos: The broad-acre legumes of N Australian grazing systems

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## Background

Early accidental introduction of *Stylosanthes humilis* into the N Australian savannas in the early 20th century and its contrived spread by the late 1960s led to the release of more perennial types. Townsville stylo, as it was known, colonised large areas and had reached its climatic and agronomic limits by the 1970s. It had a major impact on beef production in areas where natural carrying capacities were relatively low. The precedent of Townsville stylo directed attention to the genus *Stylosanthes*. This impact continued until 1974 when anthracnose virtually wiped it out. Fortunately, 2 other *Stylosanthes* spp., *S. hamata* cv. Verano and *S. scabra* cv. Seca, were released around that time. These extended the ecological range of adaptation of the genus and were adopted widely to improve dry season cattle nutrition and broaden the opportunities for economic beef production on naturally infertile, seasonally dry landscapes. Verano and Seca remain the most widely used. During that period, *S. guianensis* came and went for various reasons in the high rainfall areas. *S. hippocampoides* has found a niche on sandy subtropical soils. Two cultivars, Primar and Unica, of a new species, *S. seabrana,* have been released for cold tolerance and suitability to fertile soils. New anthracnose-tolerant *S. guianensis* varieties Nina and Temprano are creating interest in the hay industry. Most stylo sowings have been into native vegetation. Up to 1995, it was estimated that 1.15 Mha were planted to stylos. Since then, another 350 Kha (estimated from seed sales) have been planted, making a total of 1.5 Mha. With natural spread, an area of up to 3 Mha would have some stylo presence. Prolonged drought during this recent period has reduced the annual area planted. The improvements were estimated in 1996 to have added AU$20 M/year to returns from cattle across N Australia, a figure that might be closer to AU$30 M now.

## Major reasons for success

1. *Economic need*. There was an immense need for improved dry season nutrition in standing feed for cattle, which only a legume could provide. Carrying capacities and production on native grass pastures had serious limitations. Four-fold increases in stocking rates and 2-fold increases in weight gains were obtained from fertilised stylo pastures at various sites in the mid 1980s.
2. *Ease of sowing and natural spread*. Aerial sowing, even over trees, was reliable because of ease of distribution, hard seed and the ability of stylo to establish on undisturbed surfaces. There was an ongoing distribution mechanism via the digestive systems of ruminants because of the high, hard-seed factor of stylos. Up to 40% of mature seed survives this passage. Most properties across N Australia now have some stylos introduced by this method.
3. *Seed production*. The pioneering of tropical pasture seed production in N Australia, along with purposeful cooperation between private and public sectors, resulted in reliable supplies of affordable, high-quality seed that has been available throughout the whole period.
4. *Extension services*. A sustained, cooperative effort between industry and public research and extension across 4 states and 2 levels of government over 40 years provided development initiatives and financial support for the stylo program. Other opportunities for technical change, such as use of superphosphate, mineral supplementation of cattle and helicopter mustering, together with a healthy export beef market, facilitated progress in stylo pasture improvement.
5. *Sustainability*. As they attract pests, weeds and disease, and in some circumstances cause soil acidification and erosion, pure legume swards are unstable ecologically. Solutions lie in combining stylos with perennial grasses. Difficulties in the management of extensive swards still present challenges. Genetic variability in these 'wild species' has enabled them to adapt to a wide range of environments and to withstand on-going pest and disease attacks.

## On-going constraints and future potential

The size and location of N Australian cattle properties, the isolation of graziers and their conservatism and unwillingness to incur debt in periods of low profitability delayed adoption of stylo. Technology must be self-sustaining. To survive it must keep pace with biology, competition and market influences. There is a requirement for continuing access to new germplasm. This must take precedence over plant introduction barriers being applied through the ill-informed influence of the environmental movement. We need to accommodate sound environmental principles but reject unsound ones.