Huayu 31 – a large-seeded groundnut cultivar released for commercial production in Shandong, China

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Huayu 31, a large-seeded groundnut (Arachis hypogaea) cultivar (Fig. 1) was released by the Shandong Provincial Crops Approval Committee in China in 2009. Before release, Huayu 31 was called Yuanyu 16-8. The cultivar was developed from an intersectional cross 8122 × (Silihong × Arachis glabrata) following modified pedigree method at Shandong Peanut Research Institute (SPRI). 8122 is a groundnut line developed by the institute, and Silihong is a landrace of Valencia type. It has been 20 years since the fertile test-tube hybrid seed was harvested in the laboratory at SPRI in 1989, demonstrating that our efforts to rescue hybrid embryos which would otherwise abort in their early developmental stage through in vitro peg culture technique were a big success (Shen et al. 1995, Wang et al. 1999).

Groundnut cultivar releases with wild groundnut in their parentage are not new in China; for example, Huayu 20 was developed using A. cardenasii, and Yuanza 9102 and Yuanza 9307 were developed using A. diogoi. Both of the wild species belong to section Arachis (Yu et al. 2008). Huayu 31 is the first groundnut cultivar release derived from an incompatible cross in China; in the world it is also the first large-seeded variety of this kind, which may be helpful in broadening the narrow gene base of the cultivated groundnut.

In primary provincial multilocational variety evaluation test (10 sites), Huayu 31 produced mean pod yield of 5031 kg ha⁻¹ and mean seed yield of 3658 kg ha⁻¹ with 5.3% and 6.2% superiority over the check variety Luhua 11, respectively. In secondary provincial multilocational variety evaluation test (9 sites), Huayu 31 produced an average pod yield of 5229 kg ha⁻¹ and average seed yield of 3819 kg ha⁻¹, with 11.4% and 12.6% superiority over Luhua 11, respectively. In the production evaluation test (8 sites) conducted in 2008, the pod yield was 4966 kg ha⁻¹ and seed yield was 3655 kg ha⁻¹, which represented an increase of 7.2% and 11.8%, respectively over the local control Fenghua 1.

In spring sowing, Huayu 31 matures in 130 days. Huayu 31 has an erect growth habit, sequential branching pattern and green leaves (Fig. 2). Its main stem height is around 50 cm, and the number of branches is about 9.

Figure 1. Pods and seeds of groundnut cultivar Huayu 31.

Figure 2. A plant of Huayu 31.
The 100-pod weight is 220 g and 100-seed weight is 91 g. The shelling outturn is 72.9%. Both its pods and seeds are of export type. When planted in Shandong peninsula, Huayu 31 had larger pods and seeds, better seed color and higher shelling outturn when compared with Luhua 9, the popular groundnut cultivar of export type in China. The cultivar exhibited drought tolerance and high yield potential especially in barren soil as demonstrated by groundnut farmers’ feedback.

According to the 2005 report based on mixed samples from four sites from Food Supervising and Testing Centre (Ji’nan), Ministry of Agriculture (MOA), China, Huayu 31 contained 25.0% protein, 51.2% oil, 5.2% moisture, 43.1% oleic acid (O) and 37.4% linoleic acid (L) (in total fatty acids) and the O/L ratio was 1.15. The 2009 report from the Food Supervising and Testing Centre (Wuhan), MOA, China gave essentially the same results. The protein content was 24.8%, oil content was 52.6% and the O/L ratio was 1.05.

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References

