Comparison of Varietal Grade and Yield Performance in Florida (USA) versus Queensland (Australia).

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In Australia and the USA, peanut is routinely graded with the larger kernels referred to as ‘Jumbos’. They attract appreciable price premiums because they are more mature, better tasting, and hence increase profitability for both growers and the industry. Factors such as drought, insect, disease incidence and other stresses are known to affect the proportion of ‘Jumbos’, however even in the absence of such stress factors large differences across environments have been observed, but not documented. In this study we compared kernel grades of 4 peanut cultivars; Chifley (UF00620), Holt (UF98509), Page (UF97611) and UF 37 (UF05308) grown in Bundaberg, Queensland, Australia (24° 51' S, 152° 21' E), and in Gainesville, Florida, USA (29° 39’ N, 82° 20’ W). All crops were grown under non-limiting conditions. Kernel grades were determined using the standard USA grading system. When averaged over all cultivars, peanuts grown in Bundaberg had nearly a third more ‘Jumbos’ compared to Gainesville (43% compared to 33%). The proportion of ‘Jumbos’ at Bundaberg would have been even higher if most of the 14.5% of sound splits resulting from over dry samples were included. ‘Medium’ grade kernels were considerably higher in Gainesville (42%) compared to Bundaberg (11%). For both ‘Jumbo’ and ‘Medium’ grades, cultivar and location differences were highly significant, however their interactions were not. The sound mature kernels (SMK’s) produced at Bundaberg had 100-kernel weights which were 17% higher than at Gainesville. The Bundaberg environment was also more favorable for obtaining higher average pod yields (6.7 t/ha compared to 5.6 t/ha at Gainesville). These yield results are also well supported by our peanut crop modeling analyses using the Agricultural Production Systems Simulator (APSIM), where average potential pod yields of 8.2 t/ha at Bundaberg and 6.4 t/ha at Gainesville were predicted during the period from 2001 to 2009. The higher proportion of ‘Jumbo’ kernels, and higher 100-kernel weight and yields in the Bundaberg compared to Florida environments appears to be related to higher solar radiation and lower maximum temperatures. The effect of these climatic factors on these yield and quality attributes needs to be confirmed as it could lead to the identification of homoclimes of Bundaberg which could be targeted for high quality peanut production.