Wheat was one of the first domesticated food crops and for over 10,000 years has been the basic staple food for most of the world. It is the most widely grown cereal crop in the world. The worldwide production of wheat in 1995–96 was 541 Mt grown in 219 Mha compared to 618 Mt produced in 2005–06 from 216 Mha.

Mirroring the world trend is Australia where wheat constitutes more than 50% of the total grains and oilseeds production annually. The area sown to wheat doubled within the last 4 decades from 7 251 000 ha in 1965 to 13 399 000 ha in 2005 (ABARE, 'Australian Commodity Statistics 2006'), with substantial gains in yield in the early years. However, while the area sown to wheat increased over the past 10 years, there has been no concomitant increase in yield during this period. Yields are oscillating and may be stagnating owing to abiotic and biotic stresses that impact on production (Fig. 1). Globally, in the last 5 years, world wheat consumption continues to outpace production. In 2002–03, world wheat production was 556 Mt against 600 Mt of consumption. In 2003–04, production was 556 Mt against 588 Mt of consumption. The estimated production and consumption for 2006–07 is 587 and 607 Mt respectively (ABARE, 'Australian Commodity Statistics 2006').

The declining trend in production is occurring against a backdrop of increasing population, decreasing land availability, decreasing irrigation water, and increasing climatic fluctuations such as drought. In the last decade, many parts of Australia have suffered ongoing drought and heat the most severe being in 2002–03 when the volume of production decreased by 58% while the area sown increased by 47% (ABARE, 'Australian Commodity Statistics 2006'). In 2006, it was estimated that over 60% of the Australian cropping area was lost to drought. The challenge for wheat breeders is to breed cultivars with genetic plasticity for yield potential beyond what is currently available in cultivated wheat for drought, optimal environmental conditions, and the constantly evolving biotic stresses limiting wheat productivity.

Against this backdrop, the 1st Synthetic Wheat Symposium was held at Horsham, Victoria, Australia from 4 to 6 September 2006. Some 85 delegates, representing 23 research groups from 4 continents, attended the meeting. This publication includes 10 of the 25 papers presented during the Symposium. The theme of the Symposium was “Synthetics for wheat improvement” and served as a global forum for current research on the use of synthetics for wheat improvement. The Symposium was hosted by Francis C. Ogbonnaya, M. van Ginkel, and R. Brettell, International Centre for Agricultural Research in the Dry Areas (ICARDA), PO Box 5466, Aleppo, Syria.

Fig. 1. Trends in wheat yield in Australia from 1995 to 2005.
from the SHWs. An example was given of a released cultivar in China outyielding the best commercial check cultivar by 23%.

A combination of SHW and its SBLs with contemporary and emerging technologies in plant breeding, physiology, and genomics offers great scope to enhance wheat productivity, improve yield stability in marginal environments, mitigate the prevailing impact of climate change in wheat production, and provide sources of novel genes against the plethora of biotic stresses limiting increased yield productivity.

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References
