Yield performance in the Australian wheat growing industry

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In a recent analysis of Australian average wheat yields, Russell (1973) found evidence of a significant upward trend over the period 1936 to 1968. More recently, Campbell (1977) cites the annual average trend over the 15 years 1960-74 as -0.078, a number which is perhaps not significantly different from zero.

It is evident that the existence or otherwise of a positive yield trend in Australian average wheat yields will be influenced by the time span chosen for analysis. The general finding is that a positive yield trend can be estimated if the time span commences prior to the 1940s. Time spans which commence after this period inevitably result in an average yield trend which is not significantly different from zero.

There is some speculation that the levelling of national average wheat yields in the post-World War II period may be associated with the expansion of wheatgrowing into climatically less favourable regions. In order to examine this proposition, analyses were carried out on yield performance in a number of "traditional" and "marginal" (or recently developed) wheatgrowing Shires in N.S.W. The study covered the period 1956-57 to 1975-76.

The main finding is that of the 9 traditional Shires and 7 marginal Shires studied, only three recorded positively significant yield trends. These Shires are Mitchell, Macintyre and Bland, the latter being classified as a marginal Shire. Many of the traditional Shires recorded no trend in wheat area and still there was no indication of any trend towards yield increase. These results cast some doubt on the argument that expansion in wheatgrowing has been a major cause of constant yields.

The average yields of the 7 marginal Shires over this period was 1.093 t ha^{-1}, ranging from 0.902 t ha^{-1} in Walgett Shire to 1.254 t ha-1 in Boolooroo Shire. The average yield of the 9 traditional Shires was 1.294 t ha-1, ranging from 1.094 t ha-1 in Talbragar Shire to 1.562 t ha-1 in Waugoola Shire. It is clear that average crop yields in at least some of the newer wheatgrowing regions are equal to or better than those in some of the traditional wheatgrowing regions.

The average yield variance of the 7 marginal Shires over this period was 0.256 t ha-1, ranging from 0.172 t ha-1 in Lachlan Shire to 0.358 t ha-1 in Boomi Shire. The average yield variance of the 9 traditional Shires was 0.240 t ha-1 ranging from 0.159 t ha-1 in Mitchell Shire to 0.295 t ha-1 in Merriwa Shire. Again it is clear that yield risks are not necessarily greater in the marginal areas than in the traditional areas.

These preliminary results indicate that the process of expansion in the wheat industry has not led directly to a levelling in national average yields. The diversity of cropping performance in different parts of the wheat belt suggests that no single, simple explanation for this phenomenon will be adequate.

Campbell, K.O. (1977), *J.* Aust. Inst. Aqr. Sc. 43 : 1, 3.

Russell, J.S. (1973), J. Aust. Inst. Aqr. Sc. 39 : 3.