Nomenclature for single and multiple back crosses in a self pollinated crop

Skovmand, B., van Ginkel M., Fox P.N. and Mujeeb-Kazi A.

International Maize and Wheat Improvemant Centre (CIMMYT), Apdo, Postal 6-641, 06600 Mexico D.F., Mexico

In our computerized managemant of pedigree data, we find that the present standard nomenclature does not allow us to describe a backcross in all its aspects. There are two ways to make a cross and, for each of these, there are four ways of making a backcross. But, for the eight possible variants, the standard nomenclature provides for only four distinct expressions. In practice, this also means that there is no way to identify the cytoplasm of progeny. For multiple backcross, the ambiguities grow geometrically.

This is not a trivial issue, particularly when crosses are made between widely separated taxa. Here the F1 is male-sterile and so it can only be used as the female in a subsequent backcross. Breeding strategies may depend on the elimination of chromosomes, and thus they may dictate backcrosses in which the female/ male roles of the parents and the F1 are already pre-determined.

We suggest adding letters between the "*" and the "/" to indicate whether the recurrent parent in a backcross is used as female (F) or male (M). In multiple backcrosses, the sequence of these letters - from left to right - corresponds to the sequence in which the backcrosses are made. Thus A//A/B which is now written A*2/B, would become A*FF/B in the proposed new nomenclature. A reciprocal backcross A/B//A, which is now written A*2/B, would become A*FM/B, thus accurately recording the sequence of backcrosses. B/3/A/B//B now shown as A/ 3*B, would be B*MMF/A in the proposed system: note that the cytoplasmic parent is always at the beginning (left) of the pedigree statement.

We invite all the interested parties to comment on the proposed convention. CIMMYT's Wheat Pedigree Management System (WPMS) will be programmed to use the new nomenclature but with a function enabling pedigree statements to be translated back to the present standard. The present standard would be the 'default' output from WPMS, and the new version would be available on command.