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GROUPING CHARACTERISTIC WHEAT

*Document prepared by experts from the United Kingdom*

## GROUPING CHARACTERISTICS IN WHEAT

A study carried out by NIAB (Cambridge, United Kingdom).

### Summary:

The grouping characteristics included in the various UPOV Test Guidelines ought to be useful as one of the means of ensuring that candidate varieties are compared with varieties of common knowledge (i.e. as TG/1/3 states, they can be used "... to select, either individually or in combination with other such characteristics, varieties of common knowledge that can be excluded from the growing trial..."). In addition, as their names suggests, they should also be useful for organising the growing trial so that similar varieties are grouped together. In order to be useful for these purposes, and also to be reliably used in central databases of variety descriptions, grouping characteristics should ideally be (i) qualitative (discontinuous) traits, (ii) capable of precise recognition and description, (iii) easily scored according to an agreed protocol, (iv) capable of reliable recording in different countries, (v) relatively free from environmental interaction. In addition, current UPOV Test Guidelines suggest that grouping characteristics that are used for pre-selection of candidates and reference varieties in order to facilitate the assessment of distinctness "... are those which are known from experience not to vary, or to vary only slightly, within a variety and which in their various states of expression are fairly evenly distributed throughout the collection."

We have investigated the four current grouping characteristics in wheat (*Triticum aestivum* L. emend. Fiori et Paol.) in the current UPOV Test Guidelines, i.e. UPOV characteristic 10 – "Straw: pith in cross section (halfway between base of ear and stem node below);" characteristic 14 – "Awns or scurs: presence", characteristic 16 – "Ear: color" and characteristic 26 – "Seasonal type" to see to what extent they fulfil these criteria. From descriptions of more than 500 mostly European wheat varieties, it is clear that the grouping characteristics are not evenly distributed in their expression and consequently provide only moderate levels of discrimination. Furthermore, as was reported previously (TWA Mexico, 2001), there are problems in recording at least three of the characteristics in different locations, such that the same variety tested in different countries would have a different description (and could be found to be distinct from itself). At least part of this problem is caused by a difficulty in definition of one characteristic (UPOV 14: Awns or Scurs: presence), as well as potential environmental effects on the expression of others.

These problems would not occur – or at the very least would be minimised – if other characteristics that did fulfil the above criteria were used. In particular, the seed storage protein composition (HMW glutenin sub-units – already included in the current UPOV Test Guidelines, and gliadins – not a UPOV characteristic) would be excellent as grouping characteristics, and data will be presented from a study of almost 200 varieties to demonstrate this. These characteristics would also be ideally suited for compilation and utilisation in databases of variety descriptions, as they can be reliably recorded in different countries using internationally agreed protocols, with no environmental interactions.

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