**Supplementary Figure.** Kanota x Ogle (KO) 2008 DArT map with annotated comparisons to previous maps. Linkage groups from the new DArT map are shown on the left with interim group names prefixed by ‘KOD’. This map was produced by an iterative consensus-building process using methods described in the text. It incorporates framework markers from the Wight et al. (2003) map as well as most new DArT markers that were polymorphic in KO. Fine ordering of DArT markers should be considered arbitrary, and markers at identical positions (rounded to the nearest cM unit) are shown as un-named crosshairs. Maps on the right, with groups prefixed by ‘KOW’ are from Wight et al. (2003) unless indicated otherwise (AH = Atlantica x Hirtula). The length of the placement crosshairs on the KOW groups indicates the tendency of a placed marker to stretch the map. No DArT markers are placed on the KOW map. Red lines indicate homology between mapped markers, and blue lines indicate inferred homoeology based on cross-hybridizing probes. Lines are dashed if they connect to a marker shown as a placement cross-hair. Map scales vary, but are consistent within connected comparisons. Annotations are given in blocks of text where appropriate.

17-7-C Breakpoint: In the new map, we have segregated a dense cluster of markers that we assume are associated with the chromosome 17-7C translocation breakpoint. Placement bars and homology lines are shown for all markers (this fragment only) to indicate that this dense cluster is confined to a short region. Markers not within this cluster are now mapped separately (see KOD…X1-X4) in an attempt to discover whether four chromosome arms associated with a meiotic quadrivalent can be resolved separately. Note that markers within this cluster can be resolved to linear regions of other maps (see discussion).
Breaking up the 1_3_38 super group: Grouping in the DArT map brought together KOW group 1 with KOW_3+38, but disrupted the previous order. Speculating that the ordering of these groups is affected by pseudo-linkage of more than two chromosome arms to the translocation breakpoint, we have removed the breakpoint cluster and attempted to order smaller groups. Most of these correspond to the previous KO_3+38 group, allowing KOW_1 to fit with a fragment from near the breakpoint cluster. In the new map, it appears as though fragments X1, X2, X3, and X4 may correspond to 3 or four arms of the quadrivalent. This will need to be confirmed by comparison to new DArT maps.
Some stretching of the DArT map occurs relative to the KOW framework map occurs in some places. This is partly due to the attempt to incorporate a greater number of markers. Markers that stretched the KOW framework were systematically removed.
Some differences in map length may result from excluding certain markers. Other differences may result from the discovery of a better marker order. In this case, the reduced length of linkage group 22_44+18 has probably resulted from a combination of these factors.
Marker CDO1433 linked to two new DArT markers, but this linkage made it impossible to order these markers with the remainder of linkage group 5 when group 30 was joined in the new map (see figure for KOD_5_30).
The new orphans: these groups are formed from markers that were not previously joined in the old map, or new DArT markers that do not link to pre-existing groups. They might represent satellite groups from locations near telomeres, where recombination is frequent.