8.2 FRIEDRICH J. KOPISCH-OBUCH[1], MARTIN KIRCHHOFF[1,2], FELIX UHLMANN[1], NINA PFEIFFER[1], JOSEPH OGUTU[3], ELENA ORSINI[4], AXEL SCHECHERT[4], CHRISTIAN JUNG[1]

[1]Christian Albrechts University of Kiel, Germany
[2]Nordsaat Saatzucht GmbH, Langenstein, Germany
[3]University of Hohenheim, Germany
[4]Strube Research GmbH & Co. KG, Söllingen, Germany

QTL FOR WINTER HARDINESS AND POST WINTER BOLTING RESISTANCE IN SUGAR BEET (*BETA VULGARIS* SSP. *VULGARIS* L.)

QTL de la tolérance au gel et de la résistance à la montaison de betteraves sucrières (*Beta vulgaris* ssp. *vulgaris* L.) / QTL der Winterhärte und Schossresistenz nach Winter von Zuckerrüben (*Beta vulgaris* ssp. *vulgaris* L.)

ABSTRACT

Growing sugar beet (*Beta vulgaris* L.) as a winter crop in cool temperate regions requires the development of a winter sugar beet with controlled bolting and sufficient winter hardiness. To identify genetic factors for winter hardiness, an F3 population derived from crossing a winter hardy with a winter susceptible sugar beet inbred line was grown over winter at three field locations in Northern and Central Germany. Survival rates determined after winter ranged from 5 to 91% for F3 families across locations. The genetic effect on survival rate was highly significant ($p < 0.0001$) and had a heritability of 89%. A linkage map was constructed and two major QTL were mapped for each field location. Together these QTL explain more than 30% of the phenotypic variation for winter hardiness and should be suitable for marker assisted selection of winter hardiness in sugar beet. To obtain genetic control of bolting after winter we have identified a sugar beet accession with strongly delayed bolting after winter and high degree of post winter bolting resistance. We grew an F3 population derived from that accession in the field and we observed a large variation for both traits. A major QTL was identified which explained 65% of the phenotypic variation. These results offer new perspectives for breeding sugar beets which do not bolt after winter.