LONG, JORDAN, HEATHER WEBB and STEPHEN HARPER*, Germains Seed Technology, Hansa Road, King's Lynn, Norfolk, PE30 4LG, UK. **Speed and uniformity of sugar beet seed germination determined by automated image capture and time course analysis.**

Yield potential of sugar beet crops is reduced by slow and protracted emergence. Smaller seedlings trap less of the available solar radiation and poor root uniformity causes greater losses at harvest. Seed priming confers a degree of tolerance of adverse seedbed conditions, but affects yield potential primarily because of faster and more uniform germination. Speed of laboratory germination has been shown to be closely correlated with speed of emergence in the field. We have developed technology for automated germination time course analysis that finds application both in priming protocol development and in commercial product quality assurance. Pictures of germinating seed are taken at intervals, of 3 hours in our standard protocol, and analysed for germinated seedlings thus providing a detailed germination time course profile. Changes in speed, such as after priming, can be expressed simply as the difference in time taken for 50% germination (T_{50}). In tests at 20°C (68°F), XBEET is typically 20 hours faster to T_{50} than non-primed seed. This equates to 25% of the time taken to reach T_{50} by unprimed seed. Uniformity, expressed for example as the time between 25% and 75% germination (T_{25}-T_{75}) is also increased.