613. **New Technologies Call for New Research Priorities in Physical Weed Control with Low Selectivity.** Jesper Rasmussen[1], Michael Nørremark[2], Bo Martin Bibby[2]; [1]The University of Copenhagen, Taastrup, Denmark; [2]The University of Aarhus, Horsens, Denmark

A web-based digital image analysis tool (IMAGING Crop Response Analyser) has been developed, tested and made public (www.imaging-crops.dk). This new technology makes possible objective estimations of crop-soil cover (i.e. how much crop is buried with soil) associated with post-emergence weed control with spring tine harrows, rotary hoes and other weeders. Objective estimation of crop-soil cover offers new possibilities to improve decision support of physical weed control practises with low selectivity because trade-offs between weed control and resulting injury to the associated crop now may be quantified, communicated and incorporated into models. The objective of this presentation is to suggest key parameters and research priorities for future research and to suggest standards for estimation and statistical test of the analytical parameters. The overall aim is to help researchers deliver reliable parameter estimates that may help to predict the optimal intensity and timing of physical weed control with low selectivity and, thereby, contribute to the theoretical and methodological framework of physical weed control. Selectivity and crop recovery are suggested as key parameters because they are crucial in predictive models and are less influenced by site-specific soil conditions and implement settings than other parameters. Selectivity is defined as the ratio between weed control and crop-soil cover and crop recovery is defined as the ability of the crop to recover from soil coverage. Both parameters depend on the intensity of tillage. To facilitate comparisons between different studies, it is suggested that the crop soil cover associated with 80% weed control and the relative crop yield loss associated with 25% crop-soil cover are calculated with 95%-confidence intervals. Experimental protocols needed to make such calculations are outlined and factors that influence - or may influence - selectivity and recovery are listed and research priorities are given. Crop tolerance has previously been used to express the susceptibility of the crop to physical weed control, but crop recovery is shown to be more useful in decision support models than crop tolerance. Recent studies using the new digital image analysis tool and the above suggested parameter estimation procedure show that timing of weed harrowing is of lesser importance if the intensity of tillage is correctly adjusted to the growth stage compared with prediction of the optimal intensity in site-specific conditions. This latter issue remains the major challenge for future development