

## **Effects of planting method and seed size on stand establishment of soybean [Glycine max (L.) Merrill cv. Solitaire]**

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### **Abstract**

Labour and draught power shortages in many smallholder-farming communities in Zimbabwe have led to the adoption of fast planting methods characterized by little control of planting depth, which inevitably leads to poor crop stands. The experiment was a  $4 \times 2$  factorial experiment laid out in a Randomised Complete Block Design (RCBD) with four planting methods, namely: dribbling seeds behind an ox-drawn plough in alternating furrows and the seed covered by the plough; use of a harrow on land ploughed by an ox-drawn plough and furrows opened using a hand hoe and closed by feet; using a furrow opened by a hand hoe without harrowing and closed by feet; and furrows opened by a plough after a ploughing operation with the furrows closed by feet all combined with two seed sizes, one small (12 g 100<sup>-1</sup> seeds) and the other large (19 g 100<sup>-1</sup> seeds) of the soybean variety Solitaire were used to determine the effect of seed size and planting method on emergence at 21 days after planting (DAP). The study was carried out at Gowakowa and Pfumoiguru in Chinyika Resettlement Area during the 2002/2003 and 2003/2004 rainy season and at Save Valley Experiment Station (SVES) during the cool dry season of 2003 under irrigation. There was significant interaction ( $P < 0.01$ ) in 2002/2003 and 2003/2004 ( $P < 0.05$ ) at Pfumoiguru on stand count at 21 DAP due to seed size and planting method main effects. Large seed achieved higher stand count than small seed when seed was dribbled behind the plough in 2002/2003. There were no significant interaction effects ( $P > 0.05$ ) at Gowakowa and SVES during the two seasons but the highest stand counts were achieved when seed was planted in furrows opened by an ox-drawn plough. Opening furrows with hand hoes after harrowing and without harrowing also achieved high stand counts at all sites but the seedlings were prone to high mortality when exposed to low moisture conditions. There was no significant interaction ( $P > 0.05$ ) in grain yield due to seed size and planting method across all sites and seasons. However, the highest yield was achieved where furrows were opened by the plough and closed by feet. It can be concluded that use of tillage methods where planting depth is controlled and use of large seed where seed is dribbled behind the plough can result in higher stand establishment.