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Simulation of crusting in soybean crops in Northwestern Argentina

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If heavy rainfall occurs within a few days after planting, usually causes soil crusting that difficult soybean emergence. Irregular distribution of seedlings may lead to replanting the affected field. Tucumán province, located in northwestern Argentina, presents a subtropical monsoon climate, with rain concentration in summer, which frequently makes field crusting. With the objective of obtaining technical tools to make the replanting decision, a trial was carried out during five agricultural seasons, with different numbers of "no-plant gaps" per linear meter and different sizes of these "gaps", artificially generated. The treatments were: 1, 2 and 3 gaps per linear meter, with sizes from 17 to 65 cm, and the control without gaps. ANOVA were made for each one of the grains seasons evaluated.

The ANOVA for each of the five seasons indicated that in 4 of them, these differences were no significant, demonstrating the great capacity of compensation of soybean plants. However, yield decreases comparing with the control, indicating a trend. For example, with 1 to 2 gaps per linear meter, yield decline was 5 to 15%, being more drastic (15-35%) in seasons with water stress. The treatments with 3 holes of 17cm only decreased their yield between 5 to 10%, while those with 3 holes of 22cm suffered a decrease of 12 to 20%, increasing in years with water deficit (greater than 25%). Only one of the 5 seasons presented statistical differences, and it was the one with marked water and thermal stress. In this case only the treatments with 1 hole of 25 cm and 3 holes of 17cm, maintained similar yields with the control.

From this experience, it could be concluded that during regular seasons, post-planting soil crusting produces yield loss starting from 3 gaps per linear meter, no matter its size. Seasons with water deficit increase this loss.