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EFFECTS OF SUPER ABSORBENT POLYMERS APPLICATION METHODS ON CARROT GERMINATION AND GROWTH

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ABSTRACT The super absorbents (SAP) have proven to increase germination rate and yield, but the effectiveness is depends on their application methods. Three methods were investigated, (i) seeds mixed with water absorbed polymer and soil (SMP), (ii) spreading dry SAP mixed with soil in furrow (PSF), and (iii) spreading dry SAP on soil surface then ploughing the soil in 20 cm depth (PSP). The results showed that three application methods increased germination rate by 37.6(SMP), 16.7(PSF) and 5.9%(PSP) and also improved carrot yield by 20, 14 and 5% respectively when compared with their controls in the first year. The SAPs applied in soil could absorb more water to improve soil moisture and also loosen soil surface structure due to swelling. The SMP method with better mixture of SAP and carrot seeds resulted in more SAP around seeds and more air into soil, and thus higher germination rate and yield. It seemed that the increase in amount of SAPs from 45 to 75 Kg hectare-1 had no further effects on improving carrot yield for SMP and PSP methods, but evidently reduced germination rate for PSF. The increased amount of SAPs for the method resulted in more pores around seeds and more evaporation and made seeds subject to drying during germination. However, the soil applied with SAP increased carrot yields significantly in the following three years increasing from 22.62 to 50.0%. This is due to better mixing of SAPs with soil by ploughing and improving soil structures favourable to carrot growth.

Keywords: SAP, seed soaking, furrow, germination rate, crop yield