Scanning electron micrographs of polyacrylamide-treated soil in irrigation furrows. (S06-sojka162035-Poster)

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Abstract:

Water soluble anionic polyacrylamide (PAM) is now extensively used for erosion prevention and infiltration enhancement in irrigated agriculture. These PAM formulations typically have molecular weights of 12 to 15 Million g/mole. An extensive literature of PAM investigation has speculated about the physico-chemical mode of PAM interaction with soil to bring about its soil structure-stabilizing, seal-preventing and infiltration-maintaining effects. We collected 1-2 mm thick soil surface samples from irrigated furrows that had been treated with 20 ppm PAM and imaged them under a scanning electron microscope to determine if the SEM imagery verified or otherwise explained field results typically observed with PAM use. Our SEMs showed a thin veneer of PAM coating the surface of the soil, with a gauze-like netting of polymer strands. These strands enhance soil structure and ensnare microorganisms and weed seed. The PAM net also preserved pore continuity for infiltration. There was little or no visual evidence of PAM penetration into interstices between primary particles or aggregates.

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