B-106: Effect of different mulches on soil temperature and moisture content in sandy regosols

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High soil temperature can be injurious to the growth and development of seedlings and plants. The effect of temperature on plant growth is dependent on other factors such as soil moisture content. One way to manipulate soil temperature and moisture content is to provide a surface cover for which plant residues are the most common mulching material. other mulches such as polyethylene can also be used.

An investigation was conducted as the University farm, to study the effect of some mulches on soil temperature and moisture without crops. The experiment had 4 treatments in a Randomized Complete Block Design with 4 replicates. The treatments included: transparent polyethylene (TP), black polyethylene (BP), plant residue mulch (PM), natural vegetation cover (NC), and bare soil (BS) as control.

At 5, 10 and 15 cm depths, treatments TP, BP, and PM had high soil moisture contents and were significantly different from NC and BS. At 5 cm depth, the

temperature of TP and BP often exceed 40°C and the highest recorded was 55°C. The temperature of BS and NC often exceed 35°. The temperature under PM remained always below 37°C. the same pattern existed at 10 and 15 cm depths but at low values.

The results indicate that a mulch is required in sandy regosal to modify soil temperature and moisture. Clear and black polyethylene, though conserving soil moisture, raise the temperature to a level which may be harmful to crops. However, these may be suitable materials to control some soil-borne diseases before planting. Plant residue appears to be the most appropriate material to reduce the soil temperature while conserving moisture, for sandy regosol.