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<http://www.met.hu/omsz/kiadvanyok/idojaras/index.php?id=63>

Abstract

Impact of atmospheric black carbon (BC) on albedo, evapotranspiration and growing characters of field grown maize was investigated at Keszthely, Hungary over 2010 growing season. Chemically “pure” black carbon was used in weekly pollution (3 g m^{-2}). Low doses simulated effect of particulates derived from vehicle exhaust and abrasion of tyres. Albedo of crop stand (0.3 ha/treatment) was measured with CMA-11 type pyranometers every 6 seconds. Maize grown in Thornthwaite type compensation evapotranspirometers was included in the study. Dry matter yield of maize was determined in the end of the growing season. Surprisingly, BC did not influence significantly the plant height, assimilatory surface size and phenological phases. Due to humid weather in 2010, seasonal water loss of BC treated maize increased only with 4%. The seasonal mean albedo of polluted canopy declined in 0.03 (17.5%). The surplus energy retention of BC polluted crops increased canopy surface temperature of about 1°C in midday hours. Yield loss in BC polluted maize stands was only observed in rainfed canopy. Extra water of evapotranspirometers prevented yield drop-out of BC polluted crops even in the humid summer of 2010. In arid years BC is probably to induce a more severe response than that reported here, so the investigations will be continued.