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Phenolic Compound and Weed Occurrence in Cover Crop-Incorporated Soil

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Cover crops, hairy vetch (Vicia villosa cv. Hungvillosa) and rye (Secale cereale cv. Winter-green), were sown on September 28, 2006, and all biomass harvested was incorporated on April 25, 2007. The temporal change in phenolic compound wasn't any change in the control (NPK-applied bare condition) throughout the experiment. The phenolic compound in both cover crop-incorporated soils was strongly increased (about 1.5 fold) with a decomposition of the biomass until 10 days after incorporation after incorporation. The phenolic compound released from both cover crops was 1.24 fold higher (362 mg kg-1) than the control (291 mg kg-1). At 40 and 70 days after transplanting of main crop (pepper), weed density in a quadrat (50 cm × 50 cm) was examined. Weeds (grass + broad leaves) were 161 populations quadrat-1 in the control at 40 days, whereas they in hairy vetch and rye were 100 and 54, respectively. The dry matter of weeds harvested in control, hairy vetch and rye at 40 days was 41.3, 26.5, and 16.2 g quadrat-1, and at 70 days 204.9, 30.9 and 28.1 g quadrat-1, respectively. A mulching of hairy vetch and rye biomass significantly suppressed weed occurrence, 85 and 86 %, compared with the control.