The calculation of emissions from the use of pesticides is a critical issue in LCA studies of agrifood products and only occasionally discussed in details in literature studies. The objective of this study is to assess the results of the application of PestLCI 2.0 model to the production of maize in Northern Italy using site-specific soil and climate data, which were added for this purpose in PestLCI database. In this way, the application of the tool and its database were tailored to that area. Moreover, the results were compared with those obtained assuming maize cultivation on other soil typologies in the surrounding areas. Results show that soil variation scarcely affects the emissions to air and surface water whereas it affects significantly the emissions to groundwater. Finally, some features of PestLCI were highlighted and comments for a further improvement of the model were provided.