

Pesticide residues in non-target organisms - a consequence of land use change in West Africa?

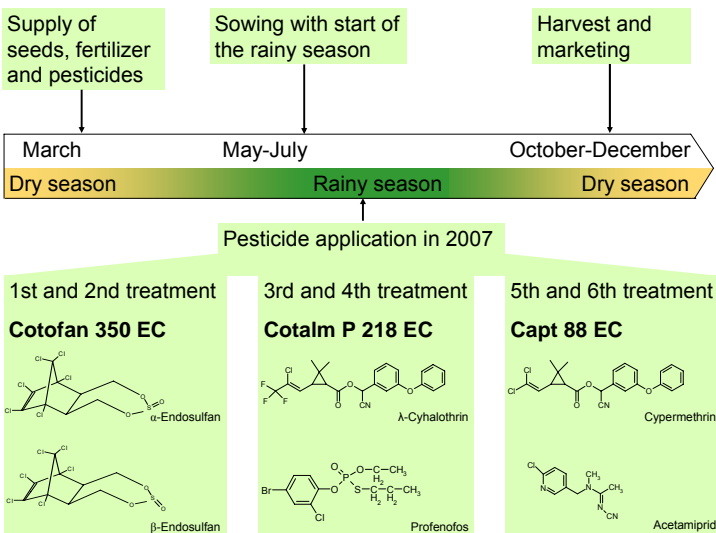
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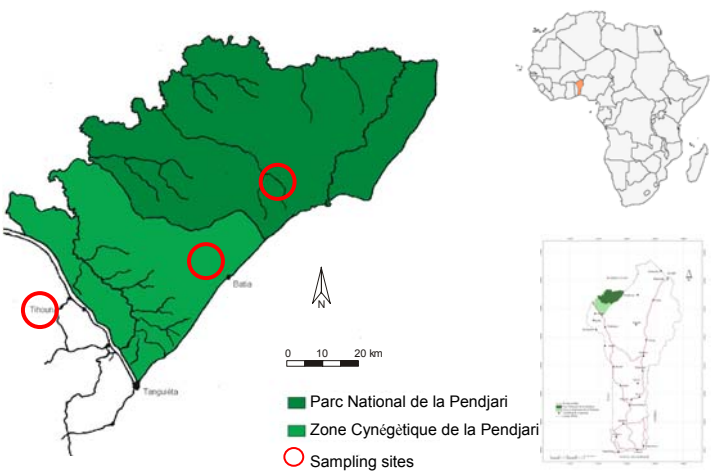
Motivation

In recent years land use in West Africa changed more and more to cash crop farming (major cotton). Cotton cultivation is known for its intensive application of pesticides as insect attacks cause 15 % of the harvest lost of cotton worldwide. In Benin 75 % of the export income is earned with cotton. The public association SONAPRA organizes the whole cotton processing and marketing and supplies the farmers with pesticides. Typical field sizes of smallholder cotton fields vary from 0.5 to 2 ha. Besides fighting against pest organisms, pesticide application is assumed to affect also non-target organisms. Thus, pesticide residue levels of selected non-target organisms will be determined. Amphibians and termites as species with low mobility and as important members of food webs are analyzed. Additionally, insectivorous bats as predators at a higher trophic level and high mobility are selected. The Pendjari National Park with its Biodiversity observatories and its vicinal agricultural zone are chosen as study area.

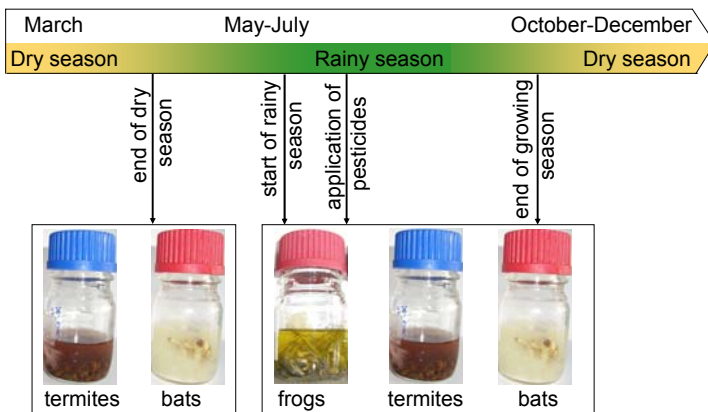
Cotton cultivation in Benin



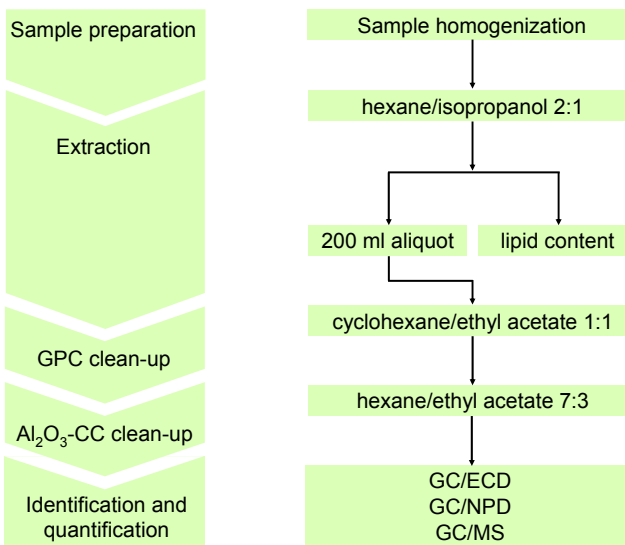
Study area



Sampling strategy



Method for pesticide residues analyses



GPC: gel permeation chromatography CC: column chromatography GC: gas chromatography with different detectors

Progress and Outlook

A method for the determination of pesticides in the different tissue matrices was adapted and measures for quality assurance were performed. The method is adjusted for both, pesticides presently used in cotton cultivation and persistent pesticides which are known to be used for cotton several years ago like DDT-isomers and cyclodiene pesticides. First samples of frogs, bats, and termites were taken in the cotton season 2008 in the three different areas. The samples are stored in isopropanol and the analyses are presently in progress. At the sampling points of the organisms also soil and water samples are taken and analyzed by African cooperation partners. Results will provide a data base to assess the impact of land use change on non-target organism and consequently on biodiversity.