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Diagnosis of pesticides use on off-season irrigated crops in Goulbi Maradi valley, Niger

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Abstract

Irrigated crops represent a valid option to fight against poverty and food insecurity in sub-Saharan Africa. To optimise yields, pesticides are systematically applied, however, constituting a potential source of human and environmental pollution. This study aimed at diagnosing pesticides use on off-season irrigated crops in the Goulbi Maradi Valley, Niger, by particularly considering the age, the educational level and cropping experience of farmers. Thus, a survey was conducted in the municipalities of Djiratawa, Maradi 3, and Tibiri with 692 farmers aged between 16 to 83 years. Pearson and Chi-square correlation tests were used to correlate data. African eggplant, cabbage, Moringa, and tomato, were the main irrigated crops listed. Caterpillars, aphids, mites and the weed *Cyperus rotundis* were the most important crops' opponents and all of the farmers controlled them by using pesticides. There were 60 products listed including 46 insecticides, 5 acaricides, 4 fungicides, 4 herbicides, and 1 organic. In total, 20 active ingredients were inventoried with the dominance of lambda-cyhalothrin, cypermethrin, abamectin, emamectin, profenofos and dichlorvos. Ten chemical families were identified and the most frequently used are organophosphates, pyrethroids and avermectins. With reference to the Sahelian Pesticides Committee list, 50 of these products were not authorised among which 8 are even prohibited, containing paraquat dichloride and dichlorvos. Also, 84.8% of the farmers had not received any pesticides training and only 14% use full outfit during treatment. As discomforts, body itching (75.7%), cold (45.5%), dizziness (44%), headache (34.7%), constipation (24.6%), nausea (24.4%), respiratory depression (20.4%), diarrhea (16.8%), and vomiting (13.3%) were mentioned. However, most farmers took a bath (98.7%) and drunk milk (59.7%) as countermeasures after applications. In addition, 84.9% of farmers conducted inappropriate phytosanitary practices including non-compliance with pre-harvest interval (49.9%), overdosing (40.6%), non-compliance with treatment frequency (19.4%), lack of safety measure (14.6%). The correlation between age, education level, and cropping experience against unsuitable application practices are all significant and negatively correlated. Indeed, urgent action and extension training offers and international efforts are required to train particularly young and uneducated farmers on the appropriate use and to probably ban and remove the stocks still available in Niger.

Keywords: : crops' opponents, discomforts, inappropriate phytosanitary practices, irrigated crops, Niger

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