# Using less toxic pesticides to mitigate the environmental effects of pesticides in South Africa

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Pesticides play a crucial role in agriculture and are extensively used in developing countries to ensure food security and economic prosperity. However, the extensive use of pesticides results in runoff into and subsequent pollution of aquatic systems. As the climate is changing (rise in temperature and precipitation), the efficacy of pesticides is reduced leading to more frequent application and extensive use of pesticides causing greater adverse effects on aquatic systems. South Africa is not spared from this pesticide pollution. To mitigate the environmental effects of pesticides in South Africa, (including QwaQwa where many farms are situated), the least toxic pesticides such as pymetrozine (a selective "EPA Reduced Risk pesticide"), should be preferably used and recommended for Integrated Pesticides Management whereas highly toxic ones such as carbaryl should be phased out to reduce pesticide pollution and unintended death of non-target aquatic organisms. The present comparative study aimed to evaluate the effects of carbaryl and pymetrozine on the behaviour of mosquito larvae (Culex spp.). Mortality experiments showed that carbaryl (0, 12.50, 25, 50 and 100 µg/L) caused more mortality than pymetrozine (0, 6.25, 12. 50, 25 and 50 mg/L), and exposure to both insecticides altered the breathing, swimming and resting behaviours of the mosquito larvae. Moreover, these toxicants altered the geotaxis of these organisms, thus compromising their fitness. From these findings, it can be noted that pymetrozine was the least toxic of the two pesticides.