Innovative biological formulation can help the control of cattle ticks

Rhipicephalus microplus, commonly known as cattle tick is a serious threat to dairy and beef cattle farming in countries where they are found, generating economic losses which has intensified over the years due to the pest's resistance to chemical pesticides. Brazil has the largest commercial herd of cattle in the world, with more than 200 million heads, with ticks being the main vector of diseases for these animals, responsible for losses around US $ 3.2 billion per year. Proposing new tick control solutions, this study addresses the efficiency of biodegradable and low-cost granular formulations containing as active ingredient the pathogenic fungus for arthropods, *Metarhizium robertsii*. The tests were carried out in semi-field conditions, using pots with *Urochloa decumbens* cv. Basilisk grass, a plant widely used in cattle breeding pastures in the tropics. The granular formulations were prepared with microsclerotia or blastospores (structures of the fungus obtained through liquid fermentation), and the pots were treated with 0.25 or 0.5 mg of granular formulation / cm^2 (25 or 50 kg / ha) applied to the surface of the soil before transferring engorged tick females in the treated soil. Mortality of the females exposed to the treated soil, the number of larvae descending from them, as well as the persistence of the fungus in the soil over 336 days were evaluated. *M. robertsii* granular formulations reduced the number of tick larvae on the pasture during the wetter season, reaching at least 64.8% of relative effectiveness, a promising percentage considering the use of a natural enemy of the target pest. The study revealed a significant decline in the persistence of fungi in the surface of the soil over time, but after 336 days it was possible to find the microorganism colonizing the rhizosphere of the grass, corroborating with recent discoveries about the biology of the fungus *M. robertsii*. The results highlight, for the first time, a strategy of using dry granular formulations for soil application to suppress the tick populations in the pasture, where 95% of the tick population is found on farms. The use of these formulations combined with other control strategies, will help farmers to obtain less infested animals and reduce ticks' resistance to chemical molecules, enabling sustainable milk and meat production, free from uncontrolled tick infestations.