

## **TRANSITIONING FROM CONVENTIONAL TO ORGANIC PRODUCTION OF VEGETABLES: THE ROLE OF PEST MANAGEMENT**

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An increase in the use of synthetic insecticides has sparked public outcry due to the risks associated with direct and indirect exposure of producers, consumers and the greater environment. This has driven the demand for agricultural products which more heavily rely upon biorational pesticides derived from natural sources including plants, microbial toxins, soaps and oils as well as insect growth regulators. Demand for pesticides from organic sources has increased as a result of their perceived as well as documented environmental and food safety. However, reports from many small vegetable producers in North Carolina, transitioning from conventional to organic production indicates that the efficacy of biorational pesticides is unpredictable. Confounding public perception, pesticides derived from the same natural sources and sold under different formulations or trade names may have a wide range of constituents. This has led to contradictory reports in the efficacy products with the same active ingredients. In an effort to dispel this misconception, particularly regarding neem-derived products, we selected three neem formulations (Agroneem<sup>®</sup>, Azatin<sup>®</sup> & Neemix<sup>®</sup>), a microbial formulation (Spinosad<sup>®</sup>) and a reference synthetic neonicotinoid insecticide (Actara<sup>®</sup>). We tested the efficacy of these insecticides in controlling pests of cowpea, pigeon pea, egg plant and collard greens over a season either as single insecticides or as a mixture on collard greens. Results confirm variation in efficacy of the tested biorational insecticides, and highlight the inherent risks in total reliance upon them. Spinosad<sup>®</sup> was effective in controlling caterpillars and beetles, but gave little protection against stink bugs and plant feeding mites. Actara<sup>®</sup> effectively controlled harlequin bugs on collards and stink bugs on cowpeas, but stimulated reproduction in mites on egg plants. Yield from plots treated with neem formulations were generally comparable to plots treated with Actara<sup>®</sup>. Pigeon pea had no serious pest infestation until pod filling, when *Heliothis* sp. and stink bugs became a threat. The major insects recorded on collard greens were the crucifer caterpillar complex and the harlequin bug, which were effectively managed with a combination of Actara<sup>®</sup> and Spinosad<sup>®</sup> applied in alternate treatments. Beneficial insect populations (especially *Harmonia axydiris*) were similar between control and biorational treatments.