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Homogeneous regular sequences and symmetric group actions

Consider a polynomial ring R on n indeterminants equipped with the action of a group G acting via algebra automorphisms. A set of n homogeneous polynomials $\{f_1, f_2, \ldots, f_n\} \subset R$ forms a *regular sequence* if the origin is the only common zero of the f_i. Of particular interest are regular sequences for which the ideal $(f_1, f_2, \ldots, f_n)$ they generate is stable under the action of G. A number of authors have considered the possible degrees $d_1, d_2, \ldots, d_n$ of such sequences for various group actions. Concentrating on the natural action of the permutation group on n letters, I will describe some of the known results and open questions about possible values for the d_i.

This is joint work with Federico Galetto (McMaster) and Tony Geramita (Queen's).