Is there potential for California alfalfa production to be climate neutral?

The California Healthy Soils program is a first-of-its-kind state sponsored program offering direct payments to farmers for agricultural practices that sequester carbon and reduce greenhouse gas emissions. Growing alfalfa is not currently an accepted practice, however previous work has clearly shown inclusion of alfalfa, a perennial crop, in agricultural systems offers climate benefits when viewed at a cropping system level. Examples include a reduced nitrogen requirement in subsequent crops, and eliminating soil disturbance for the life of the alfalfa stand which may foster carbon sequestration. To-date, we are unaware of studies that explicitly examine the potential for alfalfa to be used as tool for climate change mitigation. We utilize Life Cycle Analysis methodologies to assess alfalfa’s energy and greenhouse gas (GHG) balances on a cropping systems level for three California production systems. Additionally, we examine how various policy scenarios may impact the outcomes of the energy/GHG balances.