

NP 207 FY 2003 Annual Report

Use of a no-tillage, legume cover crop management system reverses yield decline in date palm orchards. Date palm orchards in California were experiencing continuous declines in growth and yield. ARS researchers at Beltsville Maryland helped identify the problem to be the result of soil compaction that led to salt accumulation, poor drainage and low soil fertility. A management system consisting of no-tillage and the legume cover crop, "Lana Vetch," was implemented to reduce soil compaction and add nutrients. After four years, growth and yield declines were reversed, and both yield and fruit quality increased by more than 10% while chemical input was reduced and soil quality improved.

Time to produce "maps" for precision agricultural applications greatly reduced. Past research has demonstrated that remote sensing and other spatial data can be utilized to more precisely manage nutrients and control pests. However, the processing of these data into information useful for growers and their consultants has been laborious and time-consuming, thus, limiting the use of these technologies on farm. ARS researchers at Mississippi State, Mississippi and their university and industry colleagues have developed new software to generate field scouting maps for pest control in cotton. What used to take up to an hour or more for several hundred acres can now be completed in less than a minute for several thousand acres. This means that the delivery of information can now be accomplished within a time frame to permit timely changes in management that reduce costs without compromising yield.

Dynamic cropping system approach developed. Producers are challenged to integrate a vast array of information to make management decisions that are affected by numerous factors including some, such as weather, that are outside of their control. A dynamic cropping systems approach, which is a strategy of annual crop sequencing that optimizes crop and soil use options and the attainment of production, economic, and resource conservation goals is being developed by ARS researchers in Mandan, North Dakota. Research on multiple crop sequences coupled with economic information including farm program affects (e.g., loan deficiency payments) is part of the analysis. It is based on flexibility to respond to markets, predicted weather and other factors rather than a set rotation. A dynamic cropping systems approach provides producers with management capability and capacity for developing their own long-term sustainable crop, soil, and land-use systems.