

Tree shape and foliage volume map guided precision orchard sprayer; PRECISPRAY

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An introduction is given on the contents, organization and set-up of a recently (March 2000) started EU-project (QLK5-CT-1999-01630).

Project summary

Matching spray volume and direction to tree sizes and shapes can reduce chemical application, thus reducing operational costs and environmental pollution, by 30% and more, as proven by manual or IR sensors actuated segmented boom sprayers. A tree-specific variable volume precision orchard sprayer, guided by foliage shape and volume map is proposed. Tree maps will be obtained by a novel 3D-aerial survey method, converted from defence applications, and will be incorporated as a layer into a plant protection and orchard management GIS database. The sprayer guidance module will control spray amount and direction according to the foliage structure map. The supporting GIS database will be capable to monitor infestation, utilise plant protection management and decision support systems and to keep automatically detailed records of spray applications, from the guidance system feedback.

Project objectives

The objective is to develop a tree-specific, variable volume, precision control system for orchard sprayers where the spray orientation and spray volume is adjusted to tree foliage shapes and volumes, by the guidance of a three-dimensional digital orchard map, derived from stereoscopic digital photography aerial survey. Tree shape and volume maps based spray control, incorporated in orchard management GIS, will broaden plant protection management capabilities, and will help to match chemical dosages with infestation maps. This will support pest monitoring information to build a decision support system. The sprayer will be evaluated for technical performance, pest control efficiency and environmental safety against existing sprayers.