INTEGRATION OF TECHNOLOGIES FOR HIGH ACCURACY WEED MAPPING IN LARGE PRODUCTION FIELDS.

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   Site-specific management programs require the accurate and precise identification of problem weeds within a field; however this can be a time consuming and labor intensive task. Automation of this process offers researchers a tool to map large production fields with a high degree of accuracy in a timely manor. We are in the process of developing and testing a system to provide such automation. The integration of three technologies (vegetation-sensing devices, centimeter-accuracy global positioning system and digital video cameras) allows the detection of weeds present between crop rows and the automated collection of georeferenced images. The Patchen WeedSeeker®sensors detect weeds and trigger a digital image capture system to gather an image of the targeted weed. Using a fixed base station, mobile station and radio transceivers, a real-time kinematic GPS system provides centimeter accuracy coordinates for each captured image. Images are labeled with GPS coordinates and stored in a computer database. Species identification is done post-process in the lab using the stored images. Once the data has been processed, a species-specific map can be created to investigate ecologically based questions. This system may be used to analyze ecological interactions among weed species, relative weed competitiveness, and environmental parameters. This system may also be used to study weed seed bank dynamics or to evaluate the economic potential of site-specific weed management.