



CSP Job Sheet EPM40

United States Department of Agriculture
Natural Resources Conservation Service

Water Quality Enhancement Activities

For 2005, the Conservation Security Program (CSP) offers a new enhancement activity opportunity to reward or encourage the improvement in water quality by reducing pesticide spray overlap through the use integrating Global Positioning Systems (GPS), Real Time Kinetics (RTK), laser technology, and computer guided spray nozzles to precisely and efficiently target spray to eliminate overspray. This enhancement is available once the applicant qualifies for CSP by meeting the program's entry requirements for soil and water quality.

The following information will help landowners and managers determine if they are eligible for the offered payment(s) for this water quality enhancement activity.

REDUCING PESTICIDE SPRAY OVERLAP THROUGH TECHNOLOGY

In 2001 USDA's pesticide survey indicated that 511 million pound of pesticides, herbicides, insecticides, fungicides, and other pesticides, were applied to crops. Corn accounts for 37 percent of all pesticide use and 58 percent of herbicide use. Cotton accounts for nearly half of the total insecticide use. Application of pesticides by sprayers using tractors without steering guidance systems result in as much as 24 inches in overlap to ensure full coverage. Reducing the sprayer overlap has the potential to reduce not only pesticides potentially entering the ground and surface water supplies it has the potential to reduce farm production costs. Leading edge technologies can reduce overspray.

About 250,000,000 acres in the US are planted to corn, sorghum, oats, barley, wheat, rice, soybeans, and upland cotton each year. These crops represent 77 percent of the total US cropland acreage. Pesticide costs per acre for these crops average about \$27.50 in 2005 dollars. National Agricultural Statistical Service data indicates that in 2002 the total costs of pesticides used in agricultural production was \$8.2 billion.

If an overspray of 24 inches is assumed for each pass of the sprayer and if the sprayer boom is assumed to be 40 feet wide, nearly 2,300 square feet of each acre is subject to multiple applications of chemicals. This amount to about 5 percent of each acre and on a national basis amounts to approximately 12,500,000 acres of cropland with overlap spraying.

If all overspray was eliminated, pesticide use could be potentially reduced by an estimated 25 million pounds per year at a savings to farmers of over \$400 million. For every inch overlap is reduced the reduction in pesticides applied would decrease by 820,000 pounds and save farmers \$13,700,000.

USING GPS OR OTHER SIMILAR GUIDED MEASURE TECHNOLOGY TO REDUCE PESTICIDE SPRAY OVERLAP

Traditional methods of pesticide application are being replaced by integrating Global Positioning Systems (GPS), Real Time Kinetics (RTK), laser technology, and computer guided spray nozzles to precisely and efficiently target spray to eliminate overspray.

Light bar technology helps equipment operators to steer more precise paths that reduce overspray. GPS auto guidance systems take over steering completely except for the end of the row. There are two types of GPS auto guidance systems. Differential corrected GPS (DGPS) reduces the overspray to about 4 inches. RTK GPS is accurate to sub-centimeter accuracy and is used in commercial survey work. It has been adapted to agricultural use. Its use reduces overspray to less than 1 inch (essentially zero overspray). A base unit provides the reference point that the computer and laser equipment use to establish a position in the field.

Startup costs for a DGPS are about \$10,000 and about \$60,000 for a RTK GPS. Typically, these costs can be recouped in two years on a 2,000 acre farm.

Lower technology approaches such as row markers, chalk lines, or other means off guiding equipment accurately through the field can be a substitute.

Documentation Required: A description of the system of reducing overlap, including fields being applied to and equipment being used.