

Reduced yields at field edges can make CRP grass buffers an economic option

Corn and soybean producers know they are likely to have lower crop yields on field edges than in the middle of fields.

Those yield reductions come from a combination of factors including compaction from traffic on field edges; increased weed and insect pressure; and competition with adjacent vegetation for sunlight, water, and nutrients.

Conservationists asked researchers from Mississippi State University (MSU) to more closely measure yield drops at field edges and compare yield losses by type of edge. MSU researchers also were asked to compare the economics of growing corn and soybeans to the field edge with the economics of enrolling field edges in grass buffers with the U.S. Department of Agriculture's (USDA) Conservation Reserve Program (CRP).

Researchers Wes Burger, Philip Barbour, and Steve Martin estimated average yields for 104 corn and 56 soybean fields in Mississippi with three different types of field margins and compared the estimates to yields from the field interiors.

The three field margin types adjacent to the crop evaluated were row crop, herbaceous (pasture, idle fields, grass, etc.), and woody (forests, hedgerows, etc.) plant communities.

The researchers used GPS-referenced yield monitors to estimate dry yield in the first four combine header swaths (each swath 24 feet) next to the edge, as well as the field interior.

They found corn yield was more influenced by proximity to edge and edge type than soybean yield. Corn yield was substantially reduced (13–38%) immediately adjacent to all types of plant communities relative to yield from the field interior.

As expected, greatest yield reductions occurred next to wooded field

margins. Soybean yield was only moderately reduced (6–14%) immediately adjacent to all types of plant communities, relative to interior field yield. Both corn and soybean yields were only slightly reduced by the third (48–73 ft) and fourth (74–96 ft) combine swaths adjacent to all types of plant communities.

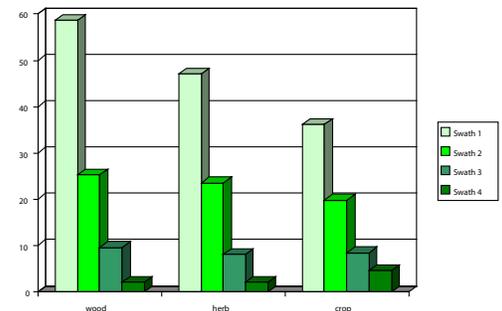
To compare economics of no use of field borders with the use of CRP buffers, researchers constructed partial budgets to develop break-even analyses on profitability with and without CP33-type buffers.

The break-even analyses showed that a number of factors influenced whether or not CRP CP33—Upland Wildlife Habitat Buffers were more profitable than cropping field edges. The most important factors included the type of plant community adjacent to the crop, expected yield reduction and crop yield, county soil rental rates, and expected commodity prices.

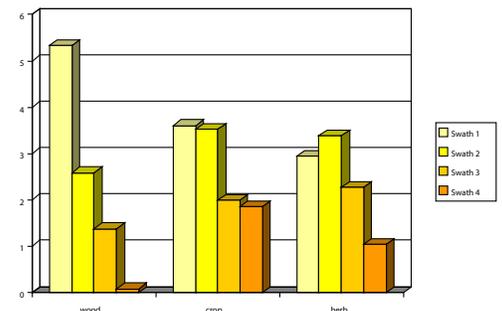
On average, if soil rental rates are \$59 per acre, production costs are \$320 per acre, corn price is \$4 per bushel, and expected yield is less than 150 bushels per acre, it would be economically beneficial to enroll up to 30 feet in CP33. If expected yields were below 125 bushels per acre, it may be economically beneficial to enroll 60 feet in a buffer. In soybeans, assuming \$150 per acre production costs and \$8 per bushel commodity price, CP33 buffers 30 to 100 feet wide could be more profitable than cropping if expected yields were less than 32 bushels per acre.

The study was aided by a grant from the USDA Natural Resources Conservation Service (NRCS) Agricultural Wildlife Conservation Center (AWCC).

The AWCC, located in Madison, Mississippi, is a fish and wildlife technology development center.



Mean corn yield reduction (bushels per acre less than field interior mean) on field edges next to wood, crop, or herbaceous plants.



Mean soybean yield reduction (bushels per acre less than field interior mean) on field edges next to wood, crop, or herbaceous plants.

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