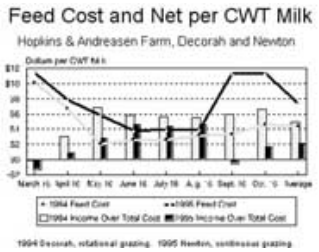
Strip Intercropping - 1995

ISU agronomists Rick Cruse and Mo Ghaffarzadeh continue to work with producers to evaluate narrow strip intercropping (Table 7). In 1995, two farmers even planted double rows of corn in the strips, seeking to take advantage of the available sunlight with high planting populations (Figure 12).

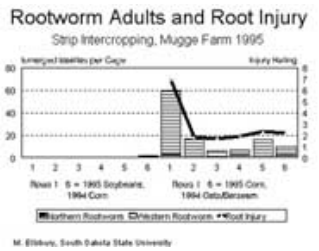
Figure 12. Strip and intercroppin yields and stands by row.



Cruse and Ghaffarzadeh worked with Tom Frantzen and Steve Rash (not a PFI member) to evaluate twin-rows of corn. Final populations were not sufficiently high in 1995 to test the potential of this technique. The second planter pass damaged the seedbed created the first time through. If the principle of double rows ever proves sound, better equipment could be customized for the purpose.

Twin rows or not, in 1995 plant population presented itself as one of the next challenges. In three cases, an outside row of the corn strip exhibited a low yield that could be statistically associated with low stand: Tom Frantzen's row 4, Jeff Olson's row 6, and Paul Mugge's row 1.

Figure 13. Emerging adults and root injury showing rootwaorm larvae migration.



Row 1 was on the south side of the strip in the case of Mugge and Rash and on the west side for Olson and Frantzen. Row 1 was next to soybeans and the last row was next to oats for everyone but Rash, for whom it was reversed. Jeff Olson's row 6 exhibited numerous stunted corn plants. He suspects that stalk borers moved in from the foxtail in the adjacent oats/berseem strip. Paul Mugge's row 6 did not yield well, but not because of low stand. Grasshoppers moved over from the neighboring oats strip after finishing every blade of the oats reseeding.

Through Rick Cruse, Mugge also worked with Mike Ellsbury, an entomologist from South Dakota State University. Ellsbury investigated the possibility of rootworm damage in the strip system. He sampled the soil for eggs, trapped emerging rootworm beetles, and measured root injury at different locations in the strips (Figure 13). He found that, while there were few rootworm eggs in the soil where corn was planted, western corn rootworm larvae migrated underground from the soybean strip into the first row of corn. Root injury to the corn in that row (row 1) was significantly greater than in other rows of the strip.

Ellsbury believes rootworm damage is one reason row 1, on the south edge of the strip, did not produce a greater yield than other rows. From this year's work, it is impossible to know how common this problem is in strip intercropping, but Ellsbury's research demonstrates that rootworm larvae can migrate. Future trials will evaluate possible solutions, such as running a tractor wheel between strips to create compaction

Table 7. NARROW STRIP INTERCROPPING TRIALS

COOPERATOR	CROP	CROP ROTATION	ROW DIRECTION	YIELDS (bu.)			COMMENTS
				STRIP	FIELD	DIFF.	
MUGGE	CORN	C-S-O	E-W	163.1	159.7	3.4	GRASSHOPPER DAMAGE IN NORTH ROW OF CORN STRIPS
MUGGE	SOYBEANS	C-S-O	E-W	50.1	55.0	-4.9	
MUGGE	OATS	C-S-O	E-W	68.0	73.1	-5.1	
MUGGE	CORN	C-S	E-W		153.5		CORN AND SOYBEAN YIELDS GREATER IN C-S-O THAN C-S
MUGGE	SOYBEANS	C-S	E-W		52.2		
OLSON	CORN	C-S-O	SE-NW	124.0	137.1	-13.1	STAND REDUCTION IN EAST ROW – STALKBORERS?
OLSON	SOYBEANS	C-S-O	SE-NW	41.1	48.7	-7.7	