# TECHNICAL NOTES

## U. S. DEPARTMENT OF AGRICULTURE
## SOIL CONSERVATION SERVICE
## MICHIGAN

Technical Note - Agronomy #16

SUBJECT: Visual "Benchmark" References and Estimates. Crop Residues Measuring Techniques.

Objectives:
To provide photographs of measured amounts of crop residue left on the soil surface and to provide employees with methods for field measurements of crop residue left on the soil surface.

Background:
CONSERVATION TILLAGE is the single, most widely adapted, and effective soil conservation practice currently available. Erosion control benefits from conservation tillage depend on the amount of crop residues left on the land after each tillage operation, especially, the last one at planting time.

The crop residue photographs on the reference sheets show measured amounts of corn, wheat, and soybean residue left on the surface. They are to be used as guides for visual estimates of crop residue left on the soil surface. These reference photographs should be supported by field measurements periodically, especially, in questionable, marginal, or critical situations. The instructions for measuring residue left on the soil surface are to be used to support field judgements.

Robert R. Ditson

Robert R. Ditson
State Resource Conservationist

Attachment

7254A

March 1980

# MEASURING CROP RESIDUES

**Collecting, drying, and weighing** crop residues from sample plots is the most accurate way to determine the pounds of crop residue per acre. (The field shown has 2,050 pounds of wheat residue per acre on the surface after tillage.)

1. Using a one square yard frame, a bag, and cutting tools, remove all surface residue contained by the frame at three randomly selected areas.
2. Dry the residue removed.
3. Weigh the dried residue from all three plots and record the total weight in ounces.
4. Multiply the combined dry residue weight in ounces by 100 to determine the pounds of residue per acre.

**Line-point sampling** is another technique for measuring crop residues left on the surface. The line-point method consists of observing ground cover at 100 equally spaced points along a 50 or 100 foot line or tape.

1. Lay a 50- or 100-foot tape or line diagonally across the field.
2. Count the one-foot (100 feet) or ½-foot (50 feet) marks that are touching a leaf, stem, stalk, etc. from the previous crop; each point represents one percent of the sample.
3. Repeat steps 1 and 2 at two or more randomly selected places in the field and use the average of three or more diagonal transects for "percent cover". To convert from percent ground cover to pounds of residue per acre, see Agricultural Handbook 537, page 50.

# CONSERVATION TILLAGE

"Conservation" tillage is any non-inversion tillage method that leaves protective amounts of crop residues on the surface throughout the year. How effectively "conservation" tillage reduces erosion depends on the amount, kind, and orientation of residue on the surface.

"Conservation" tillage may be used alone or in combination with other conservation practices to control erosion. Refer to the Soil Conservation Service Technical Guide or consult with a professional soil conservationist to determine the amount of surface residue needed to adequately control erosion in each field.

One or more "conservation" tillage methods or techniques are applicable to all croplands.

This is part of a series of references to help soil conservationists and farmers estimate the amount of crop residue left on the surface. Visual crop residue estimates must be supported periodically with actual residue measurements to assure accuracy and uniformity.

USDA Soil Conservation Service, East Lansing, Michigan, March 1980 7218A

**Over 6,000** pounds chopped corn residue per acre.

MI-SCS 329 C-1

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**3,900** pounds corn residue per acre on the surface.

MI-SCS 329 C-2

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USDA Soil Conservation Service, East Lansing, Michigan, March 1980 7218A

**2,200** pounds corn residue per acre on the surface.

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USDA Soil Conservation Service, East Lansing, Michigan, March 1980 7218A

**1,800** pounds wheat residue per acre on the surface.

MI-SCS 329 W-2

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USDA Soil Conservation Service, East Lansing, Michigan, March 1980 7218A

**2,400** pounds wheat residue per acre on the surface.

MI-SCS 329 W-1

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USDA Soil Conservation Service, East Lansing, Michigan, March 1980 7218A

**2,000** pounds of undisturbed soybean residue per acre.

MI-SCS 329 S-1

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**500** pounds of soybean residue per acre on the surface.

MI-SCS 329 S-2

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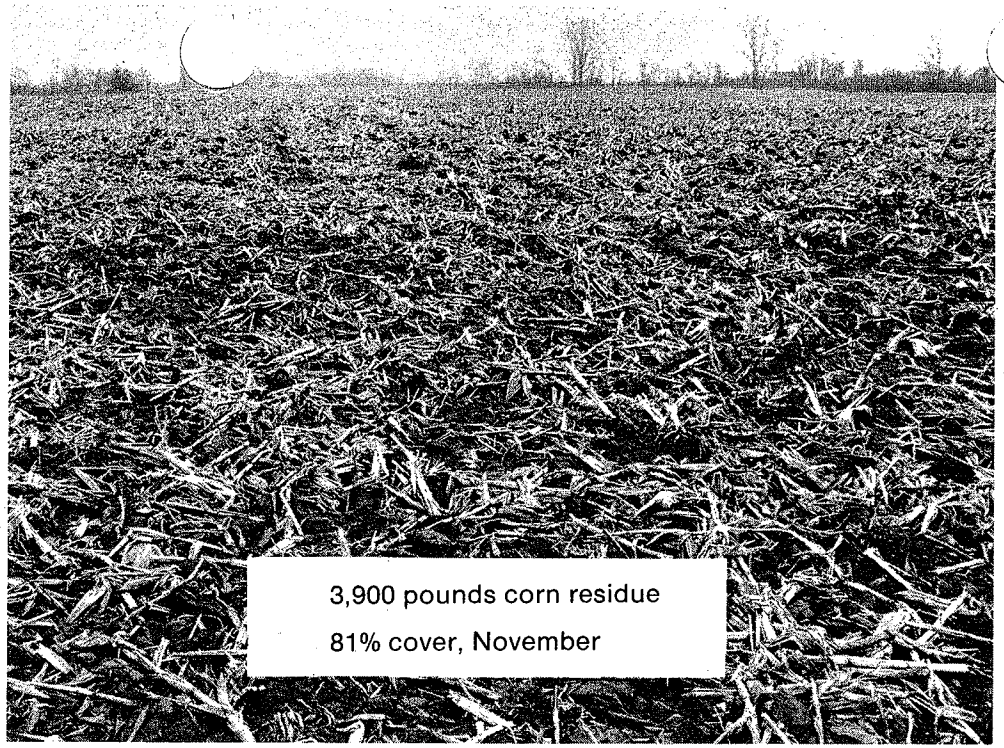
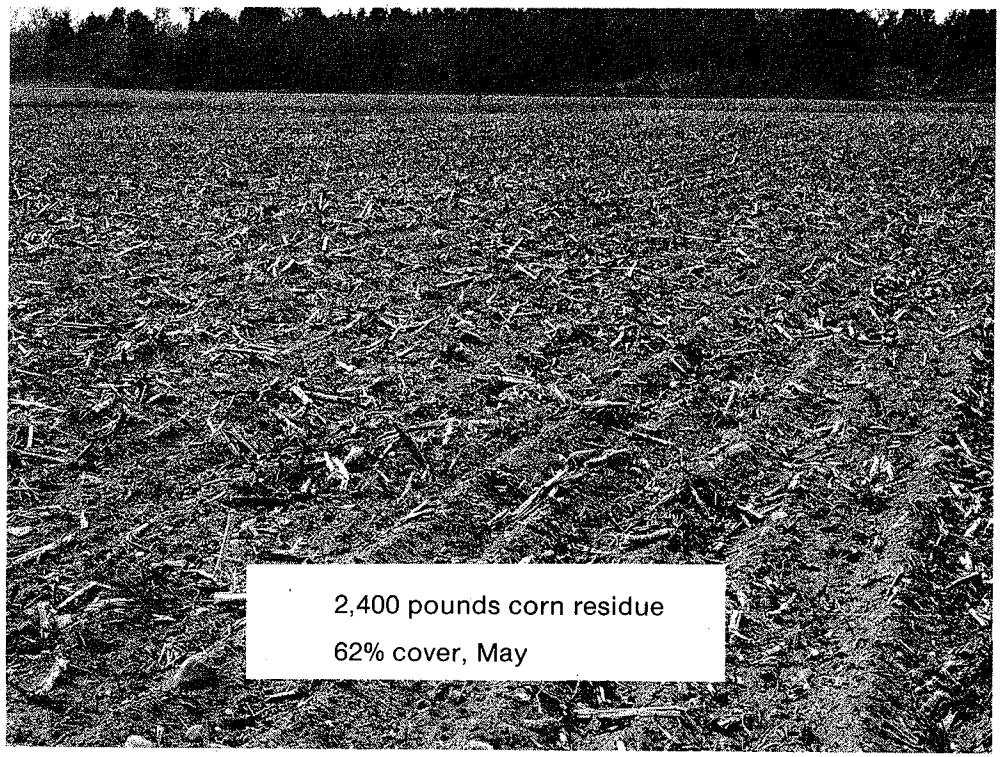
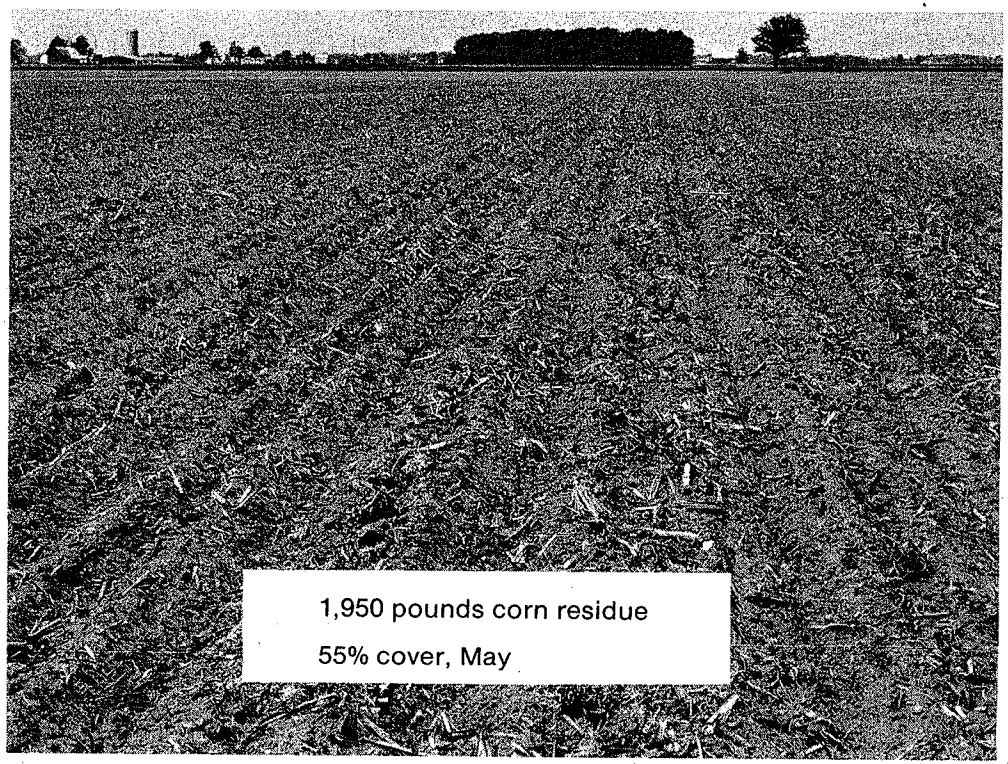
USDA Soil Conservation Service, East Lansing, Michigan, March 1980 7218A


3,900 pounds corn residue
81% cover, November


2,700 pounds corn residue
67% cover, November


2,400 pounds corn residue
62% cover, May


1,950 pounds corn residue
55% cover, May

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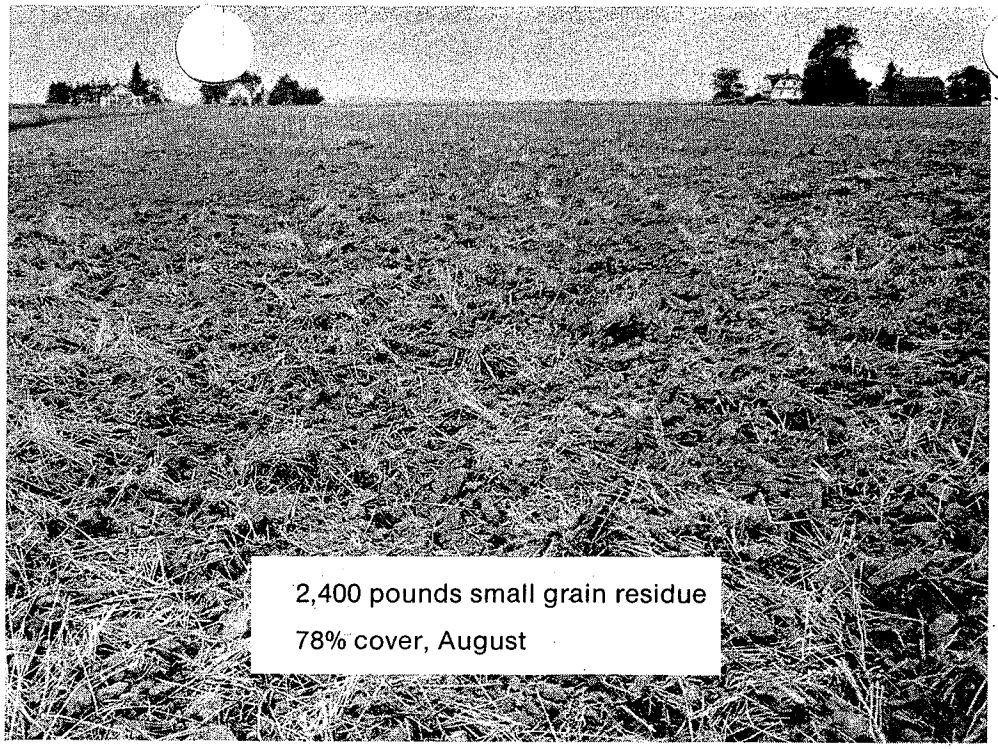
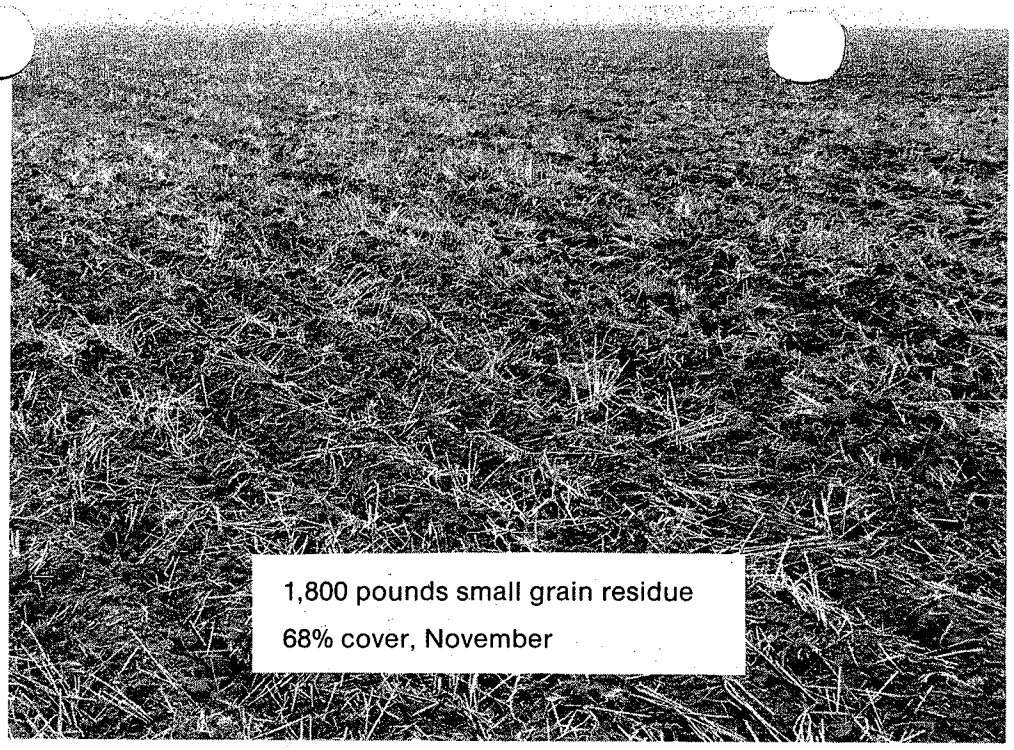
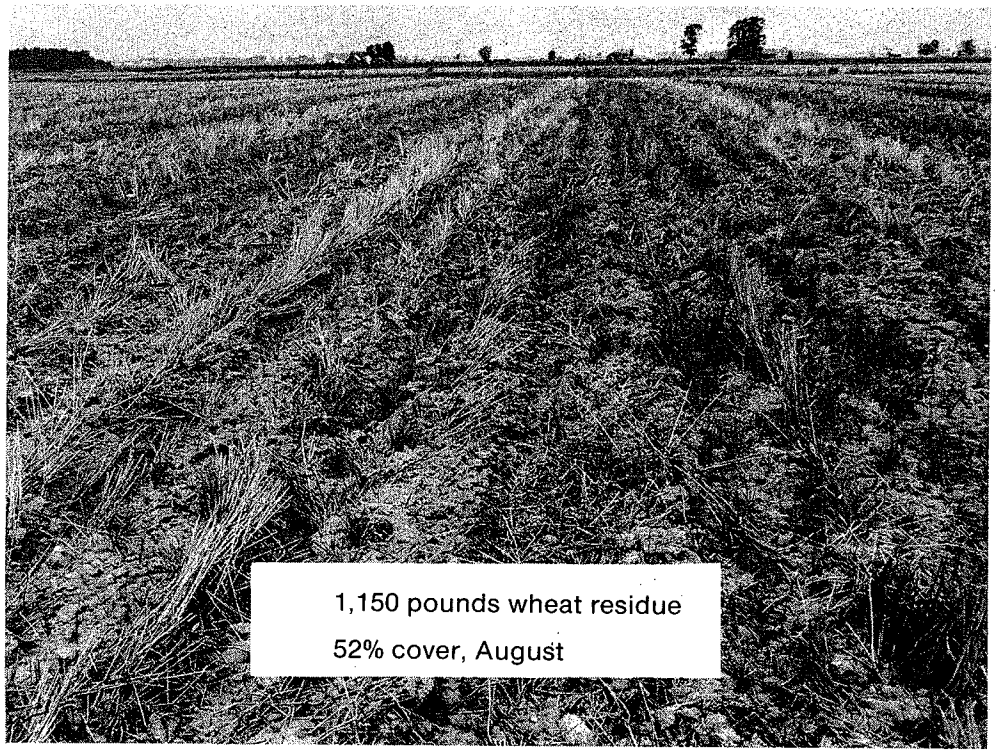
USDA Soil Conservation Service, East Lansing, Michigan 2/81,
MI-SCS-329-C4



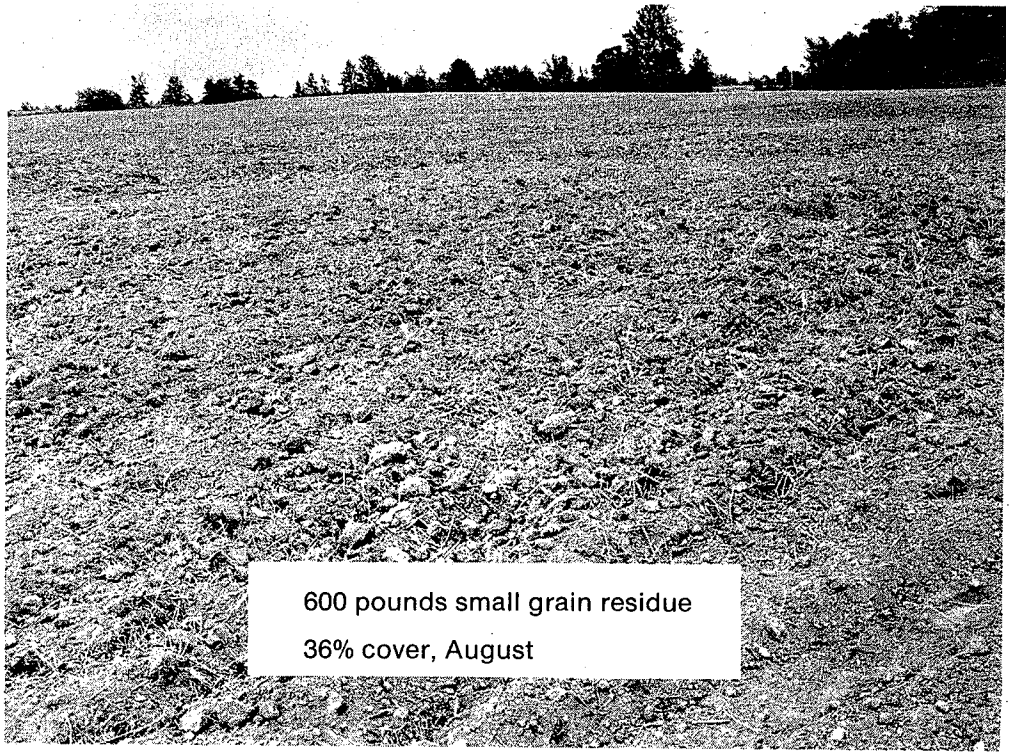
2,400 pounds small grain residue
78% cover, August



1,800 pounds small grain residue
68% cover, November



1,150 pounds wheat residue
52% cover, August



600 pounds small grain residue
36% cover, August

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USDA Soil Conservation Service, East Lansing, Michigan 2/81,
MI-SCS-329-W3
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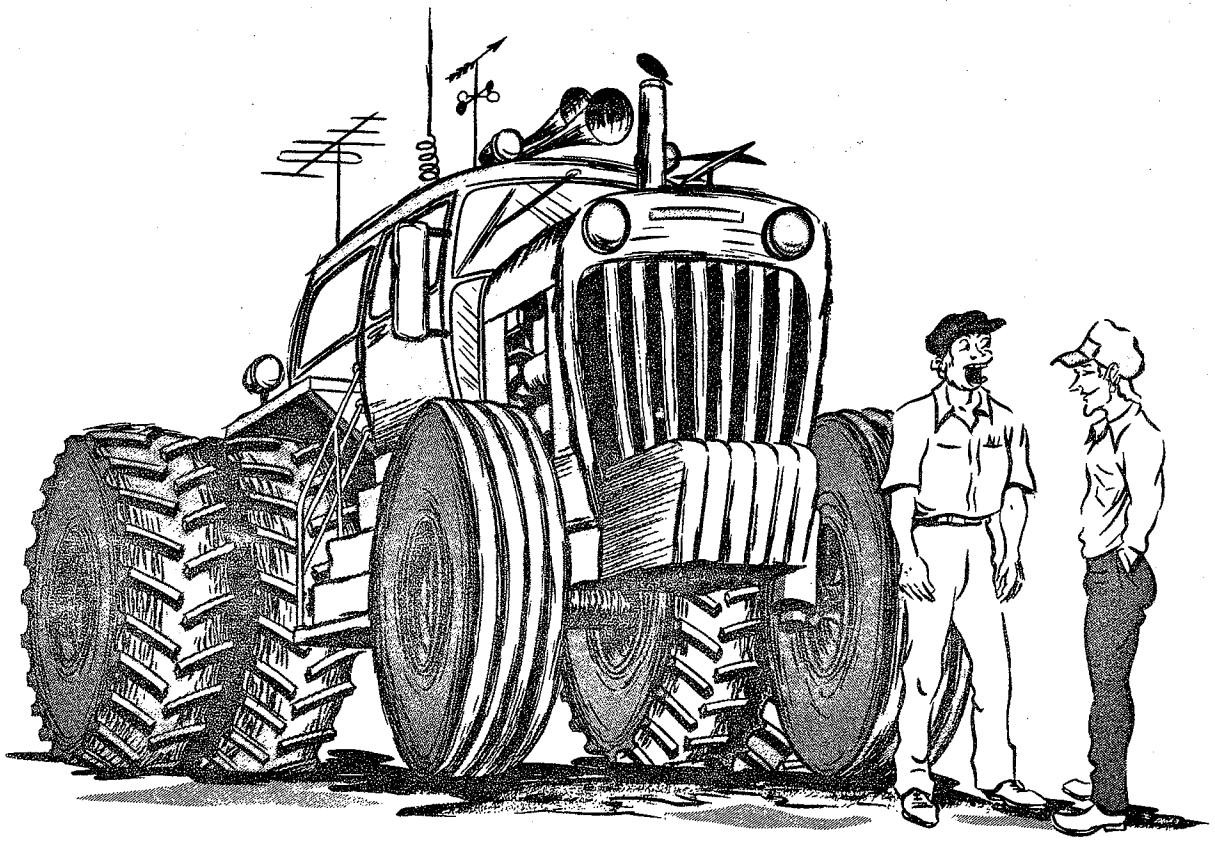

**"Sold it to an Arab -- gonna go no-till."**