

# REAP - Canada field day 1988 trials

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In this issue we have chosen to report two research trials and several demonstration plots seen on the field day (August 27) at Harry Wilhelm's. We will be reporting on the other experiments in further issues.

## 1) High Moisture Winter Barley - Soybean Relay Crop

Relay cropping consists of planting a crop (in this case soybeans) in the younger stages of an already established crop (winter barley). The soybeans are planted in the winter barley about mid May when the latter is approximately 6-12 inches in height. Under Ontario conditions we feel we can make there lay cropping system work by harvesting the winter barley as a high moisture feed grain. In an average year, harvest will take place et the end of June-1st week of July, end minimize moisture and light competition with the underlying soybean crop.

Several other advantages of harvesting the crop as a high moisture feed grain are:

- 1 ) The soybeans have less opportunity to grow into the barley canopy.
- 2) The barley is less prone to lodging and seed loss if H is harvested earlier.
- 3) Even if the winter barley yield is reduced by 25 % and the soybeans by 25% compared to normal crops the system may be more economical as the crops are grown with a minimum of fertilizer and herbicide and the soybeans grown without tillage.

Refer to OMAF factsheet High Moisture Barley, Agdex 114/52 for information on feeding quality and storage requirements.

1988 Problems:

### - DROUGHT!

- Poor winter survival and early spring growth of winter barley delayed soybean drilling which made the drought effect worse (ie low population and poor growth).
- The soybean cultivar KG 60 is a very short cultivar and does not effectively shade out weeds. This may also mean it has a short root system which would not function well in a dry year or in relay cropping systems.

## Suggestions for the future:

A more winter hardy barley needs to be developed or failing that, the winter barley needs to be seeded earlier i.e. before Oct 1 in this area. Soybean seeding could then occur in early May as opposed to late May which would help reduce the plant canopy and moisture stress on the soybean.

## 2) Rye Cover Crop Management- Rotation to Soybeans

Because winter rye matures quite early, double cropping with soybeans is possible. In this system, the first crop is harvested before the second crop is planted. Depending on the management techniques involved, the rye can be used to suppress weeds or as grain, silage or pasture.

Variations of this experiment were done at two different sites.

### 2A) Experimental Treatments:

1. Rye disced + no-till soybeans drilled into the residue
2. Rye plowed + no-till soybeans drilled into the residue
3. Rye harvested for silage end stubble disced +no-till soybeans drilled into the residue
4. Rye harvested for silage and stubble plowed + no-till soybeans drilled into the residue
5. no-till soybeans drilled into standing rye followed by rye mowing to form a mulch

## **RESULTS**

Rye Fresh Weight (May 26) = 5.95 t/ha at 83% moisture  
Forage Quality of Rye at Heading: Protein : 9.8 %  
ADF : 32.7 %

Treatment	% Ground Cover (June 18)	% Weed Cover (June 23)	% Rye Regrowth (June 23)
<b>5. Mow-Kill</b>			
1. Discd	90	3	27
3. Harvested & Discd	33 21	32 20	1 0.3
<b>2. Plowed</b>			
4. Harvested & Plowed	9 5	64 54	0 0

The Mow-kill no-till system was far superior to the tillage systems in providing adequate ground cover. If 30% ground cover is considered a minimum for conservation tillage systems, the only viable rye tillage system would be one where only discing was used. However, these figures maybe on the low side as the rye biomass was low at this site.

Poor soybean plant populations occurred on all of the tillage treatments but particularly on the diskings. This made weed control on the tillage treatments difficult even though herbicides and hand hoeing were used.

2B) At the second site, different planting date and planting methods for soybeans were tested.

### Experimental Treatments:

1. Rye harvested for silage and no-tilled soybeans (May 24)
2. No-till soybeans drilled into standing rye and rye mulched, early (May 24)
3. Rye mulched and no-till soybeans drilled into mulch early
4. No-till soybeans drilled into standing rye and rye mulched, late (June 1 )
5. Rye mulched and no-till soybeans drilled into mulch, late

### RESULTS

Rye Fresh Weight (May 24) = 20.3 t/ha at 83% moisture  
 (June 1) = 21.0 t/ha at 73% moisture

Treatment	% Ground Cover (June 24)	% Weeds (June 24)	% Rye Regrowth (June 24)
5. Mulched & no-till late	100	0	0.7
4. No-tilled & mulched late	100	0	3
2. No-tilled & mulched early	98	3	11
3. Mulched & no-tilled early	96	1	4
1. Harvested & no-tilled	90	0.3	25

The mow-kill no-till soybean production system may offer the best of both worlds, no tillage and no herbicides. It may also be the only soybean production system which can

build organic matter and provide 100 % ground cover !. This year's results indicate that soybeans should be no-tilled before rye mulching and that little or no rye regrowth occurs when the rye has reached anthesis or flowering.

In 1988-89 rye varieties will be evaluated for use in this system so that we can identify early maturing cultivars which will enable earlier soybean planting.

## **DEMONSTRATION PLOTS**

### 1) Soybeans - Mechanical weed control In 21" rows

Harry Wilhelm's system of weed control and crop management in soybeans is low cost and highly effective. The system begins by plugging two of every three runs in a 16 run grain drill

This leaves six 21" rows. Two high speed passes with the rotary hoe are followed by one to two high speed passes with a beet and bean cultivator. In a 1987 REAP trial, this system produced 60 bushels/acre of soybeans without any fertilizers herbicide. Harry uses a tall, branching variety of soybean, Pioneer 0877, which seems to fit this system very well. It helps to smother out weeds and close in rows quickly. Exceptionally good weed control can be obtained with this system at approximately one/ quarter to one/third the cost of herbicides while obtaining excellent soybean yields.

### 2) Red Clover and Rye grass Interseeding in Corn Used as Hay

A 1987 demonstration interseeding of red clover and ryegrass mixtures in grain corn was left for hay in 1988. The pure red clover interseedings appeared to be damaged by combine wheel traffic in the fall. The mixture of red clover and ryegrass suffered little damage and produced two significant forage harvests. The pure ryegrass interseedings were nitrogen deficient and produced low quantities of biomass.

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