

Increasing Yields

“ I began using annual ryegrass in 2000, working with Mike Plumer, then a University of Illinois Extension agronomist, who began evaluating ryegrass as a cover crop for the Oregon Ryegrass Commission for several years before this.

Some of my fields have fragipan soils which has layers of dense compaction. Fragipan is dense like concrete.

- **Ryegrass breaks up dense compaction**
- **Ryegrass improves root growth**
- **Long-term no-till and ryegrass increase yields**

Corn roots can grow down 16 to 20 inches and start growing horizontally once they hit dense compaction. Water can't get through the fragipan so fields dry out.

We saw noticeable changes in the soil after four or five years in no-tilled fields with annual ryegrass. After about 10 years, Mike took a soil probe with an extension and corn roots went down 60 inches in the fields with long-term no-till and 10 years of annual ryegrass. That's just unheard of on fragipan soil. ”

Ralph “Junior” Upton,
Hamilton County, Illinois

No-tills 1800 acres of corn, soybeans and wheat. Started using ryegrass around 2000.



Ralph “Junior” Upton
*Hamilton County,
Illinois*

“ I use annual ryegrass and other cover crops to farm “vertically” to access water and nutrients deep in the soil because the price of farmland is so high I can't afford to expand and farm “horizontally.” I definitely see yield benefits from using annual ryegrass as a cover crop in my longterm no-till. There's better root growth and roots reach down and get moisture in the soil. I began using annual ryegrass around 1999.

I've compared corn yields from no-tilled fields with annual ryegrass and they've yielded up to six bushels per acre better than no-tilled fields without ryegrass. But the yield differences are much greater during drought years, which I saw during the drought in 2012.

- **Ryegrass grows deeper than radish or cereal rye**
- **Ryegrass breaks up nasty compaction**
- **Works well with tile drainage**

Overall, annual ryegrass is my cover crop of choice, which I use mixes with crimson clover, etc. Annual ryegrass roots will grow way deeper than cereal rye grain roots. Radish will go way deep but they are following worm holes. Radish is way overrated.

It doesn't take a PhD to know that soil with better tilth and with better water infiltration – which allows crop roots can grow deep – will translate into a lot better yielding crops. ”

Roger Wenning
Greensburg, Indiana

No-tills corn, soybeans and winter wheat. Operates a land improvement contracting business. Began using annual ryegrass around 1999.



Roger Wenning
Greensburg, Indiana

For more information, including a detailed management guide for ryegrass as a cover crop, check the website of the Oregon Ryegrass Growers Seed Commission:

RyegrassCovercrop.com

Oregon-Quality ANNUAL RYEGRASS

Increasing Yields *(Continued)*

Ralph “Junior” Upton, Hamilton County, Illinois

In 2012, we went 100 days with no rain. Corn started burning up and some of my neighbors mowed down their corn. That summer, cover crop expert and agronomist, Mike Plumer soil probed my fields. They were bone dry at 36 inches, but Mike found corn roots and moisture 60 inches below the surface.

My corn yielded 130 bushel corn on that ground and it was because the corn roots can follow the channels

created by the annual ryegrass roots and find water. The Hamilton County corn yield average was 25 bushels per acre that year.

Cover crops are a long-term investment. You see lots of benefits even in five years, but after 10 years, even with setback years now and again, you're going to be way ahead on soil health and productivity.

Mike Plumer, Agronomist and Cover Crops Expert, Creal Springs, Illinois

Junior has fields with fragipan soil, which has a dense silt layer that doesn't allow roots to grow through it. Corn roots hit the fragipan and then grow horizontally. Now, 16 years or so after Junior started using annual ryegrass, there's no fragipan 48+ inches below the surface.

Junior's crops now have better root development where he has long-term no-till and annual ryegrass. Corn develops better and is more drought tolerant. Crop yields are higher.

Before Junior began using annual ryegrass in 2000 his corn averaged 15 bushels per acre less than the county average, according to University of Kentucky soil scientist Lloyd Murdock. But now his corn yields more than 49 bushels better than the county average.



Mike Plumer
Creal Springs, Illinois

Roger Wenning, Greensburg, Indiana

In the drought of 2012, some of the corn in my area on conventionally tilled fields without cover crops yielded less than 10 bushels per acre. My corn that's no-tilled with annual ryegrass averaged more than 100 bushels per acre. We went from mid-May to July 27 without any measurable rain. From pollination there were two weeks of 100-plus temperatures.

But my corn on no-tilled fields with annual ryegrass averaged 100 bushels per acre. Yields ranged from 120 to 180 bushel with high populations – 39,000 to 45,000 per acre (dropped) and a final stand of about 95 percent. The ears were small, but every stalk had an ear and every ear was filled. It was so dry that year I shouldn't have been getting anything. My cover crop mulches the ground and it holds moisture and keeps the soil cooler.

Annual ryegrass and tile work well together. Annual ryegrass loosens the soil and lets the water get in. With no-

till and annual ryegrass the roots goes deeper than cereal rye. Ryegrass roots open up channels and then the crop roots can follow those channels down.

The annual ryegrass roots are going down and breaking up the old heavy clay, loosening it up. I farm fragipan soil. It's a glacial till and it's just old hard and nasty. Water won't go through it and you really (do) need to get water through it. By using annual ryegrass for many years my soils are changing down to 18 to 20 inches below the surface.

It doesn't take a PhD to know that soil with better tilth and with better water infiltration – which allows crop roots can grow deep – will translate into a lot better yielding crops.

One of the benefits of the ryegrass roots and the earthworm casting is that they filter and pull nutrients out of the water as it follows the root channels and worm holes and moves down in the soil.

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