

A Receipte for Relay Cropping

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General

Relay cropping entails growing 2 crops on the same piece of land (inter-cropping), at least for a part of the season. Intercropping is rarely practiced in industrial agriculture because of the difficulties involved in controlling weeds along with planting and harvesting the 2 crops. All these factors need to be considered to successfully relay-crop. Remember that corn is a heat loving plant and ryegrass grows best under cool moist conditions.

Planting corn

Plant corn early, late April to early May. This will allow you to harvest the corn early, one of the most important secrets of success. Early (low heat unit) corn hybrids will favor early harvest. If planting after mid-May, pay very close attention to heat-loving annual weeds (see weed control section, below).

Use normal corn populations of 75,000 plants per ha. The ryegrass will perform best where the corn is thin, but deliberately favoring the ryegrass by reducing corn density is not economical.

Planting ryegrass

Plant ryegrass when the corn has 3-6 leaves. Planting when the corn is smaller will enable the ryegrass to suppress corn yield. Planting after 6 leaves will produce thin spindly ryegrass plants.

Plant ryegrass at 25-30 kg/ha. Plant in strips between corn rows taking into account the weed control program (below).

Ryegrass varieties

One of our greatest break-throughs was discovering that only tetraploid, biennial Italian Ryegrass varieties are suitable for relay cropping. Annual and diploid varieties will not persist well in the corn understory. Our suspicion is that successful persistence depends on resistance to several diseases, in particular a fungus called Fusarium.

Check with your local seed supplier for the current list of available varieties.

Weed control

This is the big challenge. Italian Ryegrass will not persist in weedy corn fields.

In Canada, the best method to control weedy grasses, especially barnyard grass, is to apply Primextra (atrazine and metolachlor) prior to or just after seeding. Some incorporation of herbicides is necessary unless there is ample moisture. The herbicide will not allow the ryegrass to establish, so it must be applied in bands over the corn rows only. This is best done by spraying at seeding time, with the sprayer mounted on the planter. Weeds between rows can be cultivated. This can only be done prior to seeding. Cultivation should be shallow to prevent root pruning and to avoid drying out the soil prior to grass seeding.

Many broadleaf weeds are controlled by Primextra, but those that are not can be sprayed after corn emergence but prior to grass seeding with a number of registered products.

Harvesting the corn

It is very important to harvest the corn as early as possible. By harvesting 10-14 days earlier the fall growth of the ryegrass may be increased by over 30%.

Some tire traffic is inevitable but attention must be paid to drive over the corn rows as much as possible and avoid driving over the grass until it is well established.

Fertilizing in spring

For best spring yield and quality, apply 50-60kg N per ha as fertilizer or slurry manure in late winter or early spring.

Winterhardiness

Ryegrass is probably nearly as winter hardy as winter wheat but less hardy than fall rye. Very small plants are less hardy to low temperature, heaving and needle-ice than well-rooted plants. We have not lost ryegrass at Agassiz in the past 5 years.

Flooding tolerance

Small ryegrass plants will withstand some flooding, but ongoing flooding for more than 1-2 weeks will severely hamper the ryegrass.

Using the ryegrass

Italian Ryegrass is reputed to be the highest quality of cool season grasses. Ryegrass is very well suited to grazing, and cows can be put out early because of early growth. Damage to the stand or compaction of wet soil is of minor concern since the field will usually be prepared again for corn.

Ryegrass also makes good green-feed and silage, although it is difficult to cure.

Fall grazing would rarely be possible in Canada, but may be practical near the coast and in the US.

The relay crop can be left through the next summer to take advantage of its high quality. To succeed farmers should consider logistics.

Can you apply manure to a relay crop in the fall?

Research is underway to determine if some manure can be applied in the fall without fear of leaching.

Eliminating the stand in the spring

Roundup will not kill ryegrass in the spring. Ploughing and allowing some rotting of the sod is the best method. Intense grazing prior to ploughing will help break down the sod.

Effect on subsequent nutrient requirement of corn

Nutrient requirements for corn will increase following a relay crop, giving greater opportunity for use of slurry manure.