



Establishing Your Field with the Best Cover Crop

- March 15, 2022
- Le Producteur de Lait Québécois Magazine

There are many benefits in using a cover crop to establish your hay crops. Several options are available, but it can be difficult to know which one would be the best choice for your farm. A recent Quebec study helps us to see more clearly!



Whether it is to obtain grains or supplemental forage, the use of cover crops represents a very interesting hay crops establishment strategy. In addition to offering an additional yield in the year of seeding, they also have other significant advantages. Thanks to their ability to cover the soil quickly at the beginning of the season, these plants help reduce soil erosion. They also compete with weeds at the time of establishment, which helps to reduce their presence in the established field.

The main objective of the cover crop is to establish a healthy and productive stand for the next few years. To achieve this, the first step is to select species that compete as little as possible with the young plants for light, water, and mineral elements.

Establishment, Yield and Quality

There are many choices available to you. Some species have been used for a long time, while others are gradually appearing in the field. With so many choices, it's sometimes hard to find your way around them. Fortunately, a team from McGill University has coordinated a research project that may answer your questions. The study tested the

performance of six different cover crops to establish an alfalfa-timothy forage mixture. Plots were established in 2019 and 2020 on three sites representative of Quebec's agroclimatic conditions: Sainte-Anne-de-Bellevue, Saint-Augustin-de-Desmaures, and La Pocatière.

Looking at the results (Table 1), we see that in the seeding year, three cover crop species stood out for improving forage yield while controlling weeds: Sudan grass, oats, and Japanese millet. The year after seeding, the same three cover crops had a slight negative effect on forage yield, but the effect was greater for Sudan grass and Japanese millet. When the seeding year and the post-seeding year are added together, oats, Sudan grass, and Japanese millet all performed well in terms of yield. In terms of quality (feeding value), oats were superior to Sudan grass and Japanese millet.

Table 1. Average performance of different types of hay crops establishment in the first two years.

Cover Crop	Average yield excluding weeds (t DM/ha)		
	Year 1*	Year 2**	Total
Without cover plant	1.9	6.8	8.7
Alexandria clover	2.0	5.9	7.9
Annual ryegrass (Italian)	1.8	6.3	8.1
Peas	2.7	6.1	8.8
Japanese millet	4.1	5.5	9.6
Sudan grass	5.0	5.0	10.0
Oats	4.4	5.9	10.3

* Averages of 5 site years, sowing done at the end of May, beginning of June (depending on the region)

** Averages of 3 site years

Adapted from St-Pierre-Lepage, 2021.

Peas have slightly increased yields without really affecting the quality of the establishment. Its main advantage is undoubtedly its quality, which is superior to that of oats. For the other species used (Alexandria clover, annual ryegrass), yields were disappointing. The results were relatively constant depending on the year of establishment or the site in this study.

How to Have a Successful Implantation with your Cover Crop

The choice of the best cover crop depends strongly on the farm's goals:

- High yields → Sudan grass, Oats, Oats-Peas, or Japanese Millet
- Yield and quality balance → Oats or Oats-Peas
- High quality → Peas or Oats-Peas

Other Success Factors

Beyond the choice of the cover crop, there are, of course, other elements to consider in ensuring its successful establishment. First, it is obvious that good basic seeding practices must be followed. Seedbed, seeding depth and pH are just a few of the many elements that must be mastered. Secondly, competition between the cover crop and the young grassland should be minimized as much as possible. The seeding rate of the cover crop must be reduced compared to a pure seeding to allow for this. It is also important to harvest the cover crop as soon as possible to quickly make room for the young establishment.

It is also important to seed as early as possible to take advantage of good moisture conditions in the spring. The seeding date should also take into consideration the needs of the selected cover crop. Finally, do not forget

to adjust the fertilization so that it adequately meets the needs of both crops. In the case of legumes, it is important to avoid over-fertilizing with nitrogen at seeding so as not to interfere with the development of nodules, which will later fix nitrogen from the air into the soil.

Key practices to follow

- Step One: Master the basics of good forage seeding
- Minimize competition with young grassland
 - Adjust the seeding rate of the cover crop
 - Harvest the cover crop as soon as possible
- Seed as early as possible while considering the needs of the cover crop
- Adjust fertilization to meet the needs of both crops
- Do not over-fertilize legume-based crops with nitrogen

Cover Crops to Improve the Resilience of Your Forage System

In the context of climate change, cover crops for harvesting as forage can diversify a farm's forage system. This is an important aspect to consider in terms of risk management. When you don't put all your eggs in one basket, you are less likely to lose everything when an event beyond your control occurs. Consider, for example, the increasingly frequent droughts, or rough winters that are less favourable to the survival of legumes.

Other species possibilities

Although not tested in the study, the use of an oat-pea mixture is another interesting strategy. Indeed, the addition of peas improves the nutritional quality of the forage, especially in terms of crude protein content. In addition, it reduces the amount of nitrogen to be used in fertilization since Peas can fix atmospheric nitrogen. Other cover crop options exist.

For example, many producers have had good success planting their hay crops into a fall cereal such as rye or triticale.



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