

Did your alfalfa stand survive winter?

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After the drought-plagued season that led to a forage shortfall in many areas of Quebec in 2018, alfalfa fields will need to be managed judiciously this year to reduce the risk of another shortage in 2019. That means you should be evaluating the condition of your alfalfa stands this spring.

Melting snow, lengthening days and rising temperatures are all signs that the time has come to visit your alfalfa field and assess the stands (number of stems per square foot). This is an essential step, as alfalfa yield potential – and hence your profit per hectare – is directly related to the number of stems per square foot, as shown in Figure 1.

Alfalfa stand assessment

Alfalfa stands are evaluated using a quadrat (Figure 2) to count the number of live alfalfa plants, or stems, per square foot. To ensure representative sampling, 10 observations should be taken in each field along a W-shaped path. The number of stems per square foot can then be used to estimate the yield potential of the stand (Figure 1).

Table 1 shows that once the number of stems per square foot reaches 55, further increases in stem density have no effect on the yield potential of the field. On the other hand, when the number of stems per square foot falls below 40, alfalfa yields will diminish significantly. If this is the case, you will need to consult your adviser and look at various options, presented in the section below, to avoid a forage shortage. Even when stem density is between 40 and 55, yields will be suboptimal. Moreover, a damaged root system will accentuate yield reductions. Therefore, the next step is to evaluate root health in your alfalfa stands.

Root health assessment

To evaluate the health of the root system, remove five or six alfalfa plants per quadrat with a shovel, to a depth of at least six inches. Then, use the rating scale provided in Table 2 to make a visual assessment of the

condition of the roots. Root health is rated on a scale from 0 (perfect condition) to 5 (dead plant), based on the size and symmetry of the crown, the number of shoots present and the coloration of the root cross-section. After examining the plants in the quadrat, you will need to decide whether to keep or replace your alfalfa stand. Healthy stands have fewer than 30 per cent of the plants with a rating of 3 or over. If more than 30 per cent of the plants in the quadrat rate higher than 3, you should talk to your adviser about strategies you can put in place to avoid a forage shortfall on your farm.

What to do if your alfalfa stand hasn't survived the winter

If winter conditions have damaged your alfalfa stands, it is time for you and your adviser to identify the best strategy to ensure that you will have a sufficient supply of forage for the next season, while taking into consideration the long-term impact of these decisions on your crop rotation plan. There are a number of different options available to you, depending on your goals and the age of your stands. Your adviser can help evaluate the options best suited for your situation.

Conclusion

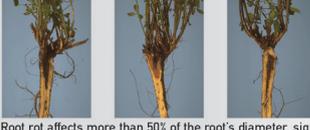
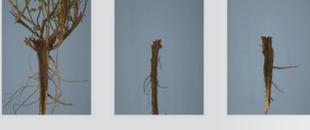
So put on your boots and grab a shovel. It's time for you to go out in the field! Don't hesitate to call on your dairy production adviser to assist you, quadrat in hand. If you want to take it one step further, you should reassess your stands in the fall. If you notice

Figure 2: A square-foot quadrat used to count the number of live alfalfa plants



any issues then, and knowing that your stands are unlikely to improve over winter, it will be easier to address the problems with a proactive strategy than a reactive one.

Table 2: Rating scale for alfalfa roots

| TABLE 2: RATING SCALE FOR ALFALFA ROOTS | |
|---|--|
| RATING 0 |   <p>Large crown, symmetrical, many shoots.</p> <p>Off-white roots with few signs of discoloration. Excellent winter survival.</p> |
| RATING 1 |   <p>Large crown, less symmetry, many shoots.</p> <p>Off-white roots beginning to show signs of discoloration. Excellent winter survival.</p> |
| RATING 2 |   <p>Smaller crown, poor symmetry, fewer shoots.</p> <p>Evidence of crown rot, vascular discoloration 3 to 4 inches deep. Roots may show one or both symptoms. Good winter survival.</p> |
| RATING 3 |   <p>Weak crown, less symmetry, fewer shoots.</p> <p>Significant crown rot and root discoloration. Good survival in mild winters; poor survival in hard winters.</p> |
| RATING 4 |   <p>Complete lack of symmetry, few shoots.</p> <p>Root rot affects more than 50% of the root's diameter, significant vascular discoloration. Not likely to survive winter.</p> |
| RATING 5 |   <p>Plant mort</p> |

Source: Alfalfa stand assessment, Undersander et al.

Figure 1 Relationship between alfalfa stem count per square foot and yield potential (Source: Undersander et al., 2011)

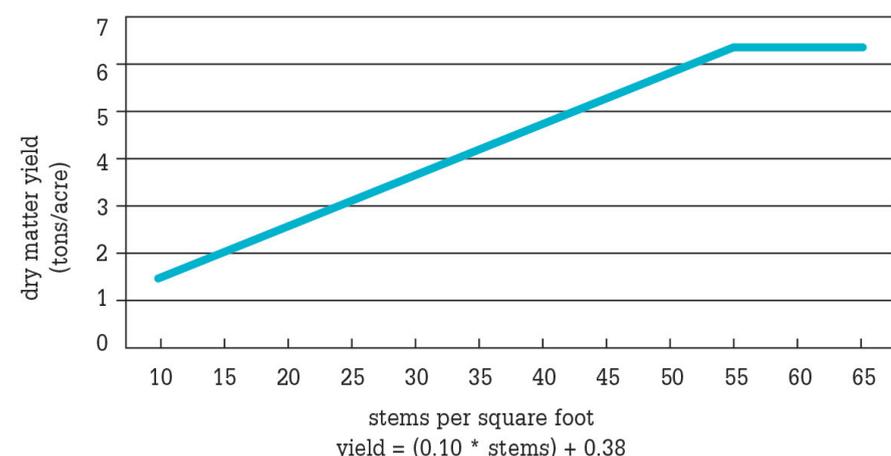


Table 1: Assessing yield potential in alfalfa stands based on the number of stems per square foot

| Number of stems/sq. ft. | Action | Predicted yield potential relative to the previous year |
|-------------------------|---|--|
| > 55 | No decrease in yield | Same as previous year |
| 40-54 | Some yield reduction depending on the health of the root system | <ul style="list-style-type: none"> If root health is good, yield reduction will be minimal. If more than 30% of the plants have a root health rating of 4* or over, yield reduction will be significant. |
| < 39 | Consider replacing the stand | Yield reduction will be significant. |

* See Table 2 for root health ratings.

Source: adapted from Undersander et al., 2011; http://forage.msu.edu/wp-content/uploads/2014/07/WI-A3620-IsThisAlfalfaStandGoodEnoughToKeep-Undersander-et-al_2011.pdf