Fertilizer use not always helpful in revegetation efforts

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Companies and communities trying to restore vegetation on damaged northern landscapes should think twice about using fertilizer to stimulate growth according to new research published in the November issue of *Arctic, Antarctic and Alpine Research*.

Not all plants benefit from the use of fertilizers. In fact, some do worse.

Stéphane Boudreau, a Professor of Ecology at Université Laval, and two colleagues spent a summer growing three types of native plants in the northern village of Whapmagoostui in subarctic Quebec. They found that a top dressing of organic fertilizer had virtually no impact on the plants while mineral fertilizer, the kind sold by gardening stores, showed mixed results.

Over the last 60 years Whapmagoostui, a village of 750 mostly Cree residents, has witnessed the loss of close to 50% of vegetation in the village and surrounding area because of land development and ATV use. The result is a community covered with bare sand but no vegetation.

"The vegetation cover in the village is all degraded. People want to live in a place that's nice," said Boudreau. In addition, the region is subject to strong winds that create sandstorms that cause some respiratory problems for the residents.

The village came to Boudreau and his colleagues for assistance with revegetation plans. Villagers selected three plant species to use in the

experiment - American dune grass, beach pea and spike trisetum.

The plants were grown outdoors and inside a greenhouse and were fed mineral fertilizer (slow release pellets or water soluble 20-20-20) or top-dressed with organic fertilizer collected from a nearby marsh. Each of the species responded differently to the fertilizers.

The organic material had a neutral or a negative effect. "Some studies show that organic fertilizer can be quite important. It can increase water retention of the soil and increase nutrient levels. But this didn't work at all. It is still a bit puzzling," said Boudreau.

Results for the mineral fertilizer were mixed. Dune grass performed well to the addition of fertilizer, the reaction of spike trisetum was mixed, while the beach pea was impacted negatively.

This was no surprise to Boudreau. "The beach pea is a legume and they tend to grow better if the substrate is poor. So if you add nutrients they don't like it too much."

Based on the results, Boudreau and his colleagues would not recommend beach pea be used in revegetation efforts in areas with similar soil. Dune grass is a much better choice. Not only does it respond well to regrowth efforts, its roots can extent to a few meters, which helps to keep sandy substrate in place.

However, no vegetation will take at Whapmagoostui until ATV traffic is contained to road areas. Although they are smaller than trucks and cars, ATVs uproot and damage new and old plants. "Up to now, they were used everywhere," says Boudreau.

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