

Ask Dr. Fill



Dear Dr. Fill

I planted a dwarf Alberta Spruce last year in my garden as I have a very small yard and I wanted something that would provide some structure without outgrowing its space. Sadly, this spring it is brown and crunchy in several spots on one side. I didn't wrap it in the fall because the tag said it was hardy to Zone 2, so I am guessing that the brown areas weren't caused by temperatures that were too cold. Should I prune those areas out, even though it will leave a large gap on one side, or will new branches eventually fill in the hole? Could it be insect damage this early in the spring? (I don't see any sign of insects on the tree). Is it possible my tree is already dying or do you think pruning might save it?

Sincerely
New Tree Grower

Dear New Tree Grower

The brown you are describing sounds like winter burn which is caused by **dehydration** that happens in cold winters when the root system is in solid frozen ground, and can't keep the tree supplied with moisture. You are correct that these dwarf spruce are zone hardy in areas much colder than here in Moncton, but that just means that the tree will 'survive'. It doesn't mean that it might not appreciate a bit of help from us to thrive! Although the foliage is dormant all winter, it still releases a small amount of moisture every day, and in sunny windy weather, that amount of lost moisture

soon adds up. The good news is that your tree is likely not dying; in fact I'll bet that you're seeing the brown bits on the south side of your tree and that the north side is still nice and green. I'd also bet that during its flush of new growth later this spring, the brown will get replaced by new green needles, so I wouldn't recommend any pruning just yet, but I will pass along some information you may find helpful, and a few things that MIGHT have caused your brown needles, other than winter burn.

Winter burn symptoms often don't become apparent until the snow starts to melt and spring temperatures rise. If it is winter burn damage, the foliage starts to brown at the tips of branches with browning progressing inward toward the center of the plant. (On broad-leaved evergreens, (like rhododendrons) leaf edges typically brown first, followed by browning of entire leaves). In some cases, trees will have no damage at all under the height where the snow covered the branches. If this is true on your tree, that's a good sign!

Foliage facing south, southwest or west is most often affected because the sunlight is stronger there in the spring as days become longer and warmer, but the roots are in ground that remains frozen, so the tree can't drink and replace the water that is evaporating from the needles on the south side. That dry foliage often begins to drop off starting in spring and continuing through mid-summer as new foliage is produced. It is true that in extreme

cases, entire plants can brown and die, but this is unusual and I'll share with you some tips to reduce any risk of this in future years.

The good news is that in most cases winter burn affects needles but not buds. This means that your tree should be able to produce new growth that will cover damaged areas. In my experience, it is often hard to find any evidence of any winter burn on my Alberta Spruce by early summer as my tree has totally greened up by then and the brown bits have been pushed off by new growth.

Before I mention other possible causes of the brown needles, I'll follow up on what you said about choosing this tree because you have a small yard. In almost all cases, these trees are a great size for a small yard. They typically grow about 3 inches a year – BUT – they can reach up to 12 feet tall, and removing a large tree that has outgrown its home can cause a huge headache in the future. Since I don't know how long you hope to garden in your current location, I'll offer this little tip. Multiply the number of years you hope to keep it in your garden by 3 and add that number to the height that your tree is now (in inches), and you'll know how large it could be in that space of time. For example, if your tree is 2 feet tall now, that's 24 inches. If you hope to have the tree there 20 years from now, then $20 \times 3 = 60$ inches. Since $60 + 24 = 84$, your "dwarf" tree could be 84 inches (7 feet tall) in 20 years. It won't be "dwarf" but it will be a beautiful specimen tree.

On a similar note, there's a chance that your dwarf spruce suddenly seems to be having a **growth spurt**. Sadly it's not proof that you're a great gardener and that your tree loves its home. Alberta dwarf spruce are a hybrid and they can occasionally **revert to the parent species**, white spruce, which is still suitable for the same climate as the Alberta spruce – but which grows MUCH faster. Hybrids that revert typically begin to send out one or two shoots with noticeably thicker stems and larger needles. If you remove them as soon as you see them sprout, they won't affect the tree's dwarf habit – just don't leave them there to grow and take over the entire tree.

While you said that your damage is mostly on one side of your tree, making me fairly certain that it's likely winter burn, there are some other things I'll mention – just in case.

Dwarf Alberta spruce are not at all tolerant of **salt spray**. If you use salt or another ice melter near your tree, or if it's planted close to a street where salt splash is possible, that could be causing your brown needles. If you think that's a possible cause, flush out the soil in the spring with lots of water; then add compost to the soil to help process some of the salts out of the root zone, or move the tree to a safer spot if possible. They'll usually survive one year's salt damage, but not repeated damage.

If brown spots begin to show up all over the tree, then check the base for possible **damage to the bark**. Check to see if a

weed whacker sliced the trunk or animals chewed the bark. If most of the bark is gone from the base of the trunk, the tree will have to be replaced. Also, think about where you planted your tree. It's unlikely that the planting site would be killing it in the first year, but if it is planted in a part of the garden that gets either waterlogged or completely dried out, the roots could rot or become so dry they aren't able to provide enough water to the tree.

You said you didn't see any insect damage, but there is also the possibility that you have some mites doing some damage. **Spruce spider mites** do attack in the spring and fall (unlike regular spider mites that are common in hot dry weather). If they ever do show up on your tree (they do love dwarf Alberta spruce) you'll see yellow speckles or brown needles at the base or near the trunk of the tree,

They can be hard to see, but if you shake a browning branch over a piece of white paper and you see tiny specks moving around, squish some with the tip of your finger. If the resulting goo is green they're spruce spider mites. But if you see red when you squash them, those are **beneficial mites** that are already eating up the spruce spider mites, and you can leave them alone to continue eating. If you do have spruce spider mites, ask at a nursery for some horticultural oil that is safe for Alberta dwarfs. It's the most environmentally friendly way to deal with them as it kills by smothering – without any toxins. However, they also kill the beneficial mite species

that may be there helping to keep spruce mites under control naturally. Controlling mites is extremely challenging. They're resistant to many chemical pesticides. The mites also leave very fine webbing behind, so keep an eye out for that. Generally, when mite populations build up enough to cause significant needle drop, it's time to find a replacement tree, so I hope that isn't the issue with your tree.

I'm also wondering when and where you planted your tree last season. If you ever decide to plant another one, or for other readers who may plan to plant one this year, they prefer to be planted in early spring – not during the heat of summer – so they have lots of time to establish good roots. If they have poorly-developed root systems that do not efficiently take up water, they are more prone to winter burn. Also choose a spot where it won't get the worst winter winds; those can also dry out the tree's needles. They need full sun in a moist, but well drained soil, but most of all, **plant them a few feet away from any other hardscape structure** or plant so that airflow and sunshine will remove moisture from their very dense foliage. They should have nothing touching them. The bottom line is that there are some dwarf trees that are less fussy than yours, but there are certainly some that are much fussier! You just want to be sure you plant them where they'll be happy! **Avoid having the back of the shrub up against a wall or foundation** as this leads to lack of good

air circulation which greatly increases the odds of a mite infestation doing severe damage before it's noticed. And in the late fall, build a **burlap tent** on the south side of your tree to help prevent future winter burn. Leave it there until you're SURE the ground is thawed and the roots can drink. It's often a little cold snap in the late spring that does most of the damage, so that's when your tree really benefits from that protection. The tree is starting to break dormancy and is heating up in the spring sunshine during the day, but it's still unable to drink water.

For most evergreens, such as boxwoods, junipers and yews, we can prune out any remaining dead, brown, damaged or dying tissue after new foliage is produced. If new foliage has not yet emerged by late spring, scratch the bark on affected branches and look for green tissue underneath. Also gently peel back the bud scales to look for inner green bud tissue. If the stem or bud tissue is green, buds on the branch may still break to form new leaves or needles. If the tissue is brown, the branch is most likely dead and you should prune the branch back to a live, lateral bud or branch. Such buds and branches may be far back inside the canopy and pruning may remove a substantial amount of the plant. But pines, spruces and firs typically produce new growth at branch tips in spring that will replace winter burn-damaged needles, and thus pruning may not be required on these evergreens. After a couple of growing seasons, new foliage will

fill in the areas that were damaged.

Never prune evergreens in late summer or early fall as it may encourage a flush of new growth that will not harden off properly before winter and will almost surely be winter burned by the next spring.

Mulch evergreens with about two inches of loose bark mulch around the base out to at least the drip line (the edge of where the branches extend), but keep it at least three inches away from the trunk or you can invite rot (and provide a nice home for gnawing rodents). Mulch will insulate your roots from severe fluctuations of soil temperatures so will reduce water loss. It also helps protect roots from injury due to heaving that occurs when soils go through cycles of freezing and thawing during the winter. Heaving can especially be a problem for shallow-rooted and newly planted evergreens – another reason NOT to plant them too late in the fall.

Plants that are well-hydrated are less prone to winter burn, so water properly. In particular, newly planted or young evergreens, especially those planted in open, exposed sites, and those planted in the dry zone under your house's eaves may suffer severe moisture loss during the winter and consequently severe winter burn. Established evergreens should receive approximately one inch of water per week and newly transplanted evergreens up to two inches of water per week during the growing season up until

the soil freezes in the autumn or there is a significant snowfall. Your Alberta spruce will eventually become more drought tolerant, but pamper it with water the first 3 or 4 years.

Avoid fertilizing in late summer or fall, as it could potentially stimulate growth of new foliage as well as inhibit proper onset of dormancy which can lead to damage over the winter.

I would highly recommend that you protect your little tree next winter as it's already suffered some damage. Use burlap or snow fencing or other protective materials to create walls to protect it from winter winds and sun. Leave the top open. DO NOT tightly wrap it up like a mummy with burlap (which you are sure to see some people doing!) as this can collect ice, trap moisture and then wick it away, making it more susceptible to damage

So, to sum up, if you agree that winter damage was the issue, be sure to give your dwarf Alberta spruce plenty of all summer and well into the fall if needed so the roots can soak in the moisture before the ground freezes. Also, spread 2 to 4 inches of mulch around it, starting 3 inches from the trunk and going out to the ends of the branches. The mulch helps hold water in the ground longer and it evens out the cold soil temperatures.

If the tree is still mostly green, future green growth at the ends of the branches will probably make up for the brown needles that will eventually fall off – you do NOT need to prune them

off. If, however, the whole tree continues to turn brown, replace it and start over with better planting and watering, or in a different part of your garden, or with another kind of dwarf evergreen. But I'm convinced that your tree will be just fine! Thanks for the great question.

Dr. Fill