

● ALTERNATIVES

# COPING WITH A MOSSY ROOF

As I write this article it's a damp, gray Pacific Northwest morning and I've already taken a trip to our garage to bring in firewood. As I grabbed the wood, I looked at the moss that's growing on the garage roof. Unfortunately, if I leave the moss to grow, it can damage my shingles. At the same time, I admire the hardy moss plants for being able to survive in a difficult environment and wonder about my options. Can I, and other Northwesters, cope with mossy roofs without resorting to pesticides? The answer to this question is not simple, but with thought and preventive maintenance, ecologically friendly moss management is possible.

## Biology and Ecology of Mosses

Mosses do not have roots, and so they can't take up water from soil as many other plants do. This means that they need flowing or falling water in order to thrive. In addition, the way mosses reproduce requires flowing water. Mosses cope with this constraint by growing in environments that are wet at least some of the time. Some species also have a remarkable ability to survive desiccation. In dry conditions they are inactive, but quickly recover when water is available.<sup>1</sup>

Mosses often grow on surfaces, like bark and rock, that plants with roots cannot penetrate. This allows them to avoid competition with rooted plants. Mosses are an important part of ecosystems as diverse as hot springs, tropical forests, and salt marshes.<sup>2</sup>

## How Much Moss Is a Problem?

There is a consensus that growth of moss on most standard residential roofing materials (either three-tab composition

shingles or cedar shingles and shakes) can damage the roof.<sup>3</sup> However, there does not appear to be data showing exactly how much moss can be tolerated by a typical homeowner.<sup>4</sup> NCAP recommends that you concentrate your moss control efforts on the parts of the roof most prone to moss problems. These will probably be on north-facing slopes and in the shade of trees or other buildings.<sup>5</sup> Parts of the roof that get direct sun are unlikely to develop moss problems.

## Prevention of Moss Problems

In areas of your roof where you need to control moss, consider first how to prevent moss growth. One option is to install a metal roof. Moss is not able to grow on the smooth surface. If you need a new roof in a moss-prone area, or if you are considering metal roofing for other reasons, this can be a useful and relatively permanent solution. Metal roofing is more expensive than composition shingles, but because metal roofs don't

have to be replaced as often, the lifetime cost is comparable.<sup>4</sup>

The second step in preventing moss problems is to remove branches that overhang the roof, shade the roofing material, and cause slow drying.<sup>6</sup> Trees near buildings are beneficial because they provide cooling in the summer and a windbreak in stormy weather, but should not excessively shade roofs. You certainly don't need to remove trees for moss control, just thin any branches that are causing lots of shade on the roof. Minimize how much climbing is necessary by using a pole pruner.<sup>4</sup>

The final step in prevention is roof cleaning. In western Oregon (and areas with similar climates), cleaning roofs once or twice a year, in the fall and possibly again in the spring, is recommended.<sup>4,6</sup> Cleaning removes debris (leaves, needles, etc.) that slows drying of the roof and removes moss plants. Cleaning a roof is, at least conceptually, simple. "In most cases, anyone who's willing to climb on the roof can wash off the material with a garden hose."<sup>6</sup> Wet sweeping will remove most of the moss, as long as plants have not gotten too well established.<sup>6</sup> Getting up on a roof can clearly be dangerous and should not be taken lightly. If your roof slope is steeper than five inches of rise per horizontal foot, you will need either to hire a professional or to use professional equipment.<sup>5</sup> You should start at the top of the roof and work down; otherwise you may damage your shingles.<sup>4</sup> If the roof has lots of moss, you may need to use a pressure washer. Pressure washers are powerful; be sure not to damage the roofing material.<sup>5</sup>



Moss growing on a composition shingle roof.

## Treatment of Problem Areas

The pesticide products most commonly sold for moss control contain zinc sulfate. NCAP does not recommend use of these products for a variety of reasons.

Caroline Cox is JPR's editor.



Prune branches of trees that overhang a roof and create conditions that favor moss growth.

Zinc, while a naturally occurring mineral and an essential micronutrient in humans and plants, is toxic at higher exposures.<sup>7,8</sup> Zinc sulfate is a severe eye irritant, has increased the frequency of miscarriages in laboratory studies with pregnant animals, and has caused genetic damage in bacteria, fruit flies, and human cell cultures.<sup>9</sup> It is toxic to aquatic animals; exposure of fish to zinc can damage their gills.<sup>10</sup> Concentrations as low as 10 parts per billion can kill fish.<sup>10</sup> Zinc sulfate is highly water soluble<sup>11</sup> and therefore is a form of zinc that causes fish mortality.<sup>10</sup>

The other problem with the use of zinc sulfate is that while it kills moss, it won't remove the plant material from the roof. If there's a significant amount of moss on your roof, you would still need to clean the roof following the use of the zinc sulfate product. Simply cleaning the roof, without using the pesticide, is less work and NCAP believes it is a more environmentally-friendly process.

A moss control product that can be used as an alternative to zinc sulfate products is zinc strips. These are strips of metallic zinc roughly three inches wide that are nailed near the top of the roof just below the peak of the roof. (The easiest

time to do this is while you're installing new shingles, but you can also install the strips on an existing roof.) Rain runs across the zinc strips and a small amount of zinc dissolves in the rainwater as zinc carbonate. The strips have the advantage that they are long-lasting and release only a small amount of zinc into the environment at any one time.<sup>12,13</sup>

The zinc strips also have several disadvantages. One is the amount of zinc that they would discharge into urban streams if widely used. The garage I mentioned at the beginning of this article is a few feet from a creek. If my neighbors and I all put zinc strips on our roofs, it's not hard to imagine that zinc concentrations in the creek would rise, although NCAP has not found any studies that monitored the amount of soluble zinc released by the strips.

A second disadvantage of the zinc strips is the application process. The label of the brand of strips available in the Northwest requires use of a pesticide prior to installing the strips in order to kill all existing moss. The label also states "it is a violation of federal law to use this product in a manner inconsistent with its labeling."<sup>14</sup> NCAP recommends that you

simply wash your roof instead. And no, we're not violating federal law in doing so. Zinc strips, along with 30 other "minimum risk" pesticides have been exempted from the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) by the U.S. Environmental Protection Agency (EPA) and therefore do not have EPA-approved labels. In fact, use of the phrase about the violation of federal law on the labels of FIFRA-exempt products is specifically prohibited by EPA.<sup>15</sup>

### Conclusion

So what should an environmentally conscientious homeowner do about a mossy roof? Keep your roof clean and prune nearby trees. (Be careful up there!) If moss thrives on your roof, think about installing zinc strips after you've cleaned your roof, but try to minimize their use. Install them only in areas where moss is a problem. Live with moss that's not damaging your roof. —*Caroline Cox*

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