4.3 Lawn Care: A Weed Free Yard

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We are talking about eliminating all weeds from a yard, not just weed control. I have seen very few, if any, yards that are weed free because such a feat for most homeowners seems impossible. But by applying good Project Management (PM, see section 8 of link) principles, it can be done.

I learned many of the principles of PM while weeding my yard because weeds have had millions of years of experience in fighting a war of attrition with humans and have not lost yet, in spite of tremendous developments in the warfare against weeds. Thus, without a good PM plan, you will always fail against weeds. By applying PM principles, I have been able to maintain weed free yards with every house that I owned (5 in all). Here is my weeding PM plan:

(1) First **prevent weeds from going to seed**; if they are allowed to go to seed, they will sprout for many years (some seeds can survive for over 5 years). Therefore, all weeds are to be removed before they go to seed.

(2) **Use all methods available for weeding**, such as chemical weed killers and hand weeding. Because I dislike chemicals, I hand weed a lot. So I hire some lawn service company to use weed killers and treat the lawn for fungi and insect infestations (they have all the knowhow and chemicals) and to fertilize the lawn, and I hand weed whatever is left. I have not yet found any lawn service company that can totally eliminate all weeds from my yard, which is understandable because they cannot follow good PM plans: the amount of education and diligence required is not affordable for them. As explained below, you have to know the yard in great detail to even SEE some of the weeds and no lawn company will know your yard better than you. A healthy lawn greatly reduces the need for weed killer chemicals, but also makes the yard susceptible to attack by fungi and insects that feed primarily on the specific lawn grass in that yard.

(3) You must **know the growth habits and life cycle of every weed**, their survival mechanisms, and how to counter those mechanisms.

Annuals, such as **crabgrass, carpet grass**, and **po-annua** can be eliminated by preventing them from seeding. Pull them all out before they produce seeds. Then remove any remaining plants because they can over-winter and re-sprout in the spring.

For weeds that propagate by rhizomes such as **nutsedge**, you will need to remove all the rhizomes. Some nutsedge, and **dollar weeds**, produce underground “potatoes” that can last for years; these potatoes cannot be located without digging up the entire infested area because they are connected to their mother plants by an almost invisible thin thread, so you need to use special tactics. Weed killers do not kill the potatoes because they protect themselves by severing the thread as soon as they detect weed killers.

For nutsedge, the best tactic is to grow a thick lawn and then remove all above-ground growths. The new shoots growing from the potatoes will search for an opening in the lawn where they can pop out of the ground since they cannot penetrate a thick matt of lawn roots. If the lawn has no bare spots, the new shoots grow horizontally under the lawn until it runs out of

energy and dies. For dollar weeds you can remove all above ground growths, then wait for the new shoots to emerge -- the potato is directly under the new shoots. It takes several years for dollar weeds to grow potatoes, so if you keep removing all new infestations, those new invaders will not make any potatoes.

There are weed killers such as sedgehammer that work on both yellow and purple nutsedge and is safe for zoysia:

http://www.clemson.edu/extension/hgic/pests/weeds/hgic2312.html

Fertilizing the lawn and watering it so it grows dense is the best permanent solution; once you get rid of nutsedge, they won't return. Weed killers will kill the growing part but nutsedge knows to sever the thread connecting the plant to the potato, and the potato will still sprout. Too much herbicide will damage the lawn and will be counterproductive if the potato remains undamaged, and might kill ornamentals such as junipers and trees; that's why I prefer hand weeding to chemicals -- herbicides really slow down the healthy growth of the lawn. It is best to pull nutsedge when they are about 4-5 inches from ground level (before mowing). They are easiest to see in back light (in transmission) about 4 days after mowing, because they grow faster than the lawn. In reflection, they are the same color as the lawn, but in transmission, they light up, so early morning or late evening is best.

The **Bermuda grass** family of "weeds" is one of the hardest to eradicate, because they grow extremely tough rhizomes deep underground. The easiest way to attack them is to pull out all the growing tips above ground, and thus deprive the plant of photosynthesis. The plant will react by downsizing, growing smaller each time they sprout; however, this takes years to kill it. They also tend to grow "crowns" that sprout many shoots; it pays to try to locate those crowns and remove them because they are closer to the surface than the deep rhizomes and you remove all the shoots connected to the crown at once. When they initially invade a yard, they have shallow rhizomes, and so can be readily pulled out completely for the first 2 years. Lawns many years old will have rhizomes over 6 inches under the surface and will take a lot of work to remove.

Dandelions used to be easy to pull out up to the 1970s. Because of the extensive use of "dandelion digger" tools, they have now evolved to grow very deep roots that are not only impossible to remove completely, but will continue to produce new shoots even if you leave only a small piece behind. They can even grow right through blacktop several inches thick. The best solution is to pull out the small ones (their roots are still shallow), and spray each large plant individually with very concentrated week killer, or even Roundup.

Dandelions and many weeds have developed a crook at their root crown so that when you pull on the weed, the plant breaks at the crook and the root remains behind. This crook apparently started as a bad mutation, but those with crooks survived weed pulling and proliferated. Not only that, but the crook gene was apparently spread to many species of plants by viruses, so that now, many species of weeds have this crook mutation. When weeding weeds with crooks, they should be pulled from below the crook so that the root is removed.

Clovers have evolved to fight weed killers by developing a hydrophobic coating on their leaves so that weed killers simply roll off the leaves. One solution is to mix detergents into the

weed killers, since detergents are wetting agents. Clovers have also developed the ability to quickly separate into many plants when attacked by weed killers; in this way, some pieces can survive even if most of the plant is killed. Therefore, after spraying a large patch of clover with weed killer, you must look for the survivors and remove them.

Oxalis or sorrel (they look like small, tender clovers with tiny yellow, pink or white lilly-shaped flowers; the leaves are either green or reddish) are easy to pull or kill with weed killers when very young (less than 1 inch diameter), but once established, is one of the most difficult weeds to eradicate. First, the plant grows a "carrot" with strong roots that make it difficult to pull out or kill with a weed killer. From this carrot, it shoots out numerous fast growing shoots that quickly cover large areas. These shoots are long but tender and easily break off when pulled; in addition, each shoot produces roots all along its length, so that any broken pieces will establish new plants if not removed. These tender shoots have a nasty habit of growing under existing lawn, so it can be very time consuming to try to remove every piece without leaving small bits under the lawn. They produce seeds when still quite small (about 1 inch in diameter) and these seeds are viable for years. Within a year, each shoot produces carrots periodically along its length, and each carrot repeats the multiplication process, while the original carrot continues to grow, becoming even more difficult to pull. Because it produces so many seeds that have a spring mechanism that throws the seeds into the wind when the seed pods ripen, the seeds can rapidly spread over large distances. The only way I know of to rid a yard of this weed is to remove every new sprout before it makes its first seed. A yard infested with it for years simply needs to be re-sodded and then meticulously maintained with special attention to removing any new growths.

(4) **Areal attack:** it is critically important to decide where to attack and how to conduct the attack. DO NOT try to weed a large area just because there are large weeds everywhere, without completely removing ALL weeds from that area. **Instead, you must work on small areas that can be weeded so completely that there is not a single weed in that small area.** There are only three exceptions to this rule: (1) when weeds are producing seeds -- they should be removed as soon as, and from as large an area, as possible, (2) when young sprouts are appearing in huge numbers and large numbers can be quickly removed, and (3) when you are using the approach of ridding the yard of one species at a time.

Areal attack is the plan of where to start weeding and how to proceed to complete the entire yard; in other words, you should not attack the entire yard at once or randomly -- this is the reason why most homeowners (and lawn companies) fail to eradicate weeds from a yard. First choose a spot to start; this may be the most visible spot, or the spot with the least weeds. **Visually mark off one or two square feet and weed that area completely.**

If you are hand weeding, a weeding tool is helpful (straight, with a forked tip), a glove can protect the fingers, but is often too clumsy for small weeds. But weeding tough weeds such as Bermuda grass can quickly get the fingers bloody because of the sharp silica particles in the leaves. However, if you then quit and try again the next day, the finger will have grown a thicker skin. If you do this often enough, the finger will gradually learn to grow a new skin faster than it will wear out, and you will be able to weed indefinitely without injury.

Now keep working in small areas and gradually increase the weeded region. Each new area must be contiguous with previously weeded areas in order to minimize the perimeter of the

weeded region. This minimizes the invasion of weeds from non-weeded regions into weeded regions, especially if you don't have enough time to finish the project quickly and have to stop weeding for weeks or months.

There are several approaches to executing this stage of the plan. If there are too many weeds so that weeding each small area completely would take so long that the rest of the yard would suffer too much, you can start by removing the most harmful weeds first, or leaving the most difficult ones for last so that you can quickly finish off the easy ones. In general, it is best to eliminate the annuals (crab grass, carpet grass) first, because this will greatly simplify the weeding the following year. One thing you will notice is that a weed free lawn will grow healthier and faster.

(5) Removing one species at a time is also effective. Start with crabgrass, then carpet grass, then clover, then nutsedge. Dandelion and po-annua need constant weeding because they can seed/sprout at any time.

(6) Maintenance: Once all weeds are completely removed for the first time, subsequent weed growth will be so low that much less work is required to maintain the yard weed free. For the first year, seeds remaining from the previous season will still sprout, but from about the second year, the number of weeds sprouting will become manageably small. **At this stage, it is most important to pull all weeds even if they are very small,** because these small ones are easy to remove, but will become much harder if left for even a month, and can actually go to seed before you notice it the next time -- pulling all new weeds while they are still small (less than 1 inch) is the easiest way to maintain a weed free yard.

One of the main reasons why most people fail to completely remove all weeds is that they can't see or identify the weeds. The weeds use coloration and other camouflage techniques that makes them practically invisible. Do weeds have eyes in order to do this? Yes! They use YOUR eyes! You will quickly remove all weeds YOU can see so that only the well camouflaged ones remain. Thus after several years of weeding I have found weeds in lawns that look just like the lawn grass in shape and with almost exactly the same color; or weeds in bluestone pebbles with the same bluish coloration, or the same weeds in red lava rock or red bark mulch with reddish color. Also if you remove all the mature large weeds, you will find that the weeds will begin to produce seeds when they are still very small.

In order to see all the weeds, it is important to get close to the ground thereby increasing your effective optical resolution. Get a waterproof mat or low chair, or squat down and get close to the ground; then remove all weeds within reach before changing to a new location; don't walk around from area to area pulling a few weeds each time; the difference in energy expended per weed pulled between the two methods can be a factor of a hundred or more. If you waste so much energy, the weeds can win the war simply by winning the energy war.

Once completely weeded, you may be surprised at how little work is required to keep it that way. In fact that is the main motivation for weeding the yard in the first place: to save you time, energy, and expense in creating a healthy lawn. If you can eliminate all weeds, in the long run, you will save more time than applying weed killers every year to control the weed problem. You will discover that "**The best weed killer is a healthy, weedless lawn**".