On Design


1.


2.


3.


4.

Kanaye Nagasawa is a name which few will recognize. Fewer still would recognize his birth-given name: Hikosuke Isonaga. Nagasawa (the name he took when he left feudalistic Japan in 1865) earned a place in Japanese history as a pioneer in the Western world. He is remembered in U.S. history as the "Grape King" of California, a master wine maker.

More people will learn of Nagasawa's place in history when they visit the gardens at Fountaingrove Country Club in Santa Rosa, Calif. Mack and Mark Tabata of Tabata Landscaping Co., Santa Rosa, designed and installed the gardens, "as a tribute to the man, not a memorial."

The entry garden represents Japanese landscape design principles: an idealistic view of nature, not a miniaturized copy of nature. Japanese pine and Japanese cherry trees help achieve this purpose (#3). Developing the site wasn't easy *(before,* #1).

The entire property, including golf course, is 120 acres, but the Tabatas worked on about seven in Phase I of the project. Trenches could not be backfilled with the rocky native soil, so the company imported 4,400 cubic yards of topsoil, sand and pea gravel to backfill and establish the finish grade.

The concept of water as an essential element of life prevails throughout the site. Water can be seen or heard at any spot on the property. The firm used dry creeks purposely to stimulate visitors' imaginations. They meticulously placed more than 3500 tons of rock to create this effect (#4). Extensive use of drought tolerant species, the dry creeks and five miles of drip irrigation minimizes water demand. Other plant material on the site ranges from low-maintenance species to high maintenance color, such as yellow and gold marigolds in focal point areas (#2)

Phase I of the project, completed in August 1986, cost $490,000. It won the California Landscape Contractors awards for outstanding achievement in design/build and first place for large commercial/industrial sites.

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RESEARCH UPDATE

Learning better sod production from Europe

by Dr. Martin Petrovic, Cornell University

Sod and seed fields represent the backbone of the turfgrass industry's production aspects. Sod demand is so tied to the construction industry that periodic shortages occur, as now in parts of the country.

Several factors have resulted in the recent need for accelerated sod production technology. These are:

1. Shortage of supply brought on by the "construction boom."

2. Increased cost of land and taxes, resulting in higher production cost per acre.

3. Suburbanization pressures on developing land rountinely used for sod production.

Accelerating production of sod would mean either more total product could be produced by a given sod grower on the same number of acres (important during a time of shortage) or the same amount of product grown on considerably less land (can spread the per acre cost over more product). Also, if sod could be produced faster, the sod grower might be more willing to grow a wider range of specialized crops of different turfgrass species and/or cultivars.

Normal production time for a cool-season sod is about nine to 18 months. Reducing the production time to less than nine months has seldom been accomplished without the use of netting. Sod production with netting has been cut to about eight weeks. But that method has not been widely used because of its high cost and its difficulty to install before seeding.

Another way to accelerate production could be to use a root impermeable layer system (RILS) which would restrict root growth above the layer.

In this case, sod strength could be developed by the massive root system produced in place of the traditional site of soil strength, namely the secondary stems of the rhizome and/or stolon. This approach has been used commercially in Western Europe by growing sod on a 3/4-inch layer of compacted pine bark mulch on black plastic (Fig. 1).

One sod grower in Ohio proposed the technique more than 10 years ago for a cool-season sod. Research has shown that it is possible to produce a warm-season grass sod in less than 65 days on a four-inch thick organic layer or plastic.

An advantage of using RILS for sod production is that any reasonably level land close to an urban center could be used for production. In addition, urban and suburban centers must dispose of organic wastes, like sewage and sludge and leaves. If used in this sod production system, it could provide an attractive economic and environmental alternative to landfills, incineration or land application.

Figure 1: The sod develops an extensive root system.

With this in mind, studies were initiated in 1986 by Cornell University to examine the feasibility of the RILS for cool-season sod production. The objectives of these studies were to:

Reducing sod production time to less than nine months has seldom been accomplished without the use of netting.

- determine how long it would take to produce Kentucky blue or bluegrass-ryegrass mixture sod by RILS vs conventional sod production techniques;
- determine if the season of the year had an effect on the time required to get a harvestable sod by RILS; and
- determine if the physical and chemical properties of the organic medium have an effect on the time of production.

Experiments were conducted during 1986 under both greenhouse conditions and in the field at the Cornell Turfgrass Field Research Laboratory, Ithaca, N.Y.

Under greenhouse conditions the following factors were studied: two temperatures, three rooting media and two seeding mixtures. The temperatures selected would conform to cool conditions of spring and fall (70°F day/60°F night) and warmer summer temperatures (80°F day/70°F night).

Black plastic was used to line flats filled with one of the following organic materials: composted pharmaceutical residue (Lederle Laboratories, Pearl River, N.Y.), composted horse manure/stable waste (Saratoga Organics, Saratoga, N.Y.) or air-dried, aerobically-digested sewage sludge (Groton, N.Y.).

Seed of either straight Kentucky bluegrass (cv. Adelphi) or a mixture of 50 percent bluegrass and 50 percent perennial ryegrass (cv. All*Star) were mixed into the organic medium. Sod tensile strength and germination were determined periodically over the 90-day period of the study.

Composted horse manure provided the best conditions for germination. Within seven days, 50 percent germination occured; within 21 days, 100 percent. In comparison, the germination on the other two media ranged from 15 percent to 37 percent after 21 days. These differences in germination also carried over into sod strength (see table 1).

continued on page 66

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SOD *from page 64*

Table 1. Days to produce a harvestable sod (≥ 3.3 psi)

Seed Type*	Organic Medium	Cooler Temperature (60°F/50°F)	Warmer Temperature (80°F/70°F)
		days	
100 KBG	Composted horse manure	54-57	68-71
100 KBG	Pharmaceutical residue	68-71	82
100 KBG	Sewage sludge	82	—**
50 KBG:59 RG	Composted horse manure	54-57	54-57
50 KBG:50 RG	Pharmaceutical residue	54-57	54-57
50 KBG:50 RG	Sewage sludge	—*	82

* 100 KBG (100% 'Adelphi' Kentucky bluegrass, 50 RG (50% 'Allstar' perennial ryegrass)
** A "—" means the sod strength of ≥ 3.3 psi was not obtained over the 90 days of the study.

Table 2. Weeks to produce a harvestable sod (≥ 3.3 psi)

Seed Type*	Rooting Media	Seeding date, 1986 June 18	August 3	September 11
		Weeks		
100 KBG	Composted horse manure	17.5	—*	—
100 KBG	Pharmaceutical residue	11.5	7.5	—
100 KBG	Soil	—**	—	—
50 KBG:50 RG	Composted horse manure	10.8	9.0	—
50 KBG:50 RG	Pharmaceutical residue	8.0	5.3	—
50 KBG:50 RG	Soil	—	—	—

* 100 KBG (100% 'Adelphi' Kentucky bluegrass, 50 RG (50% 'Allstar' perennial ryegrass)
** A "—" means the sod strength of ≥ 3.3 psi was not obtained over the course of the study.

Based on our equipment, a commercially suitable sod should have a strength of at least 3.3 psi. Under either temperature condition, Kentucky bluegrass sod could be produced within 57 days on composted horse manure and between 68 and 82 days on composted pharmaceutical residue. A harvestable sod (+3.3 psi) was produced faster on these two rooting media when a seed mixture of bluegrass and ryegrass was used. Sod production on sewage sludge was found to be slower and was related to a high soluble salt level in the sludge.

Using the greenhouse results, composted horse manure and pharmaceutical residue were tested in the field. Another treatment was included in the field, which was to seed the existing soil (Hudson silty clay loam) and manage it under conventional sod production methods. The time of seeding was used to replace the different temperature greenhouse. Seedings were made in early summer (June 18), late summer (August 3) and the recommended fall seeding (September 11).

The best time to seed (see table 2) to produce the fastest harvestable sod was late summer (August 3), followed by early summer (June 18). The fall seeding did not result in a harvestable sod. Of the organic rooting media, pharmaceutical residue produced one to six weeks faster than in composted horse manure. None of the seeding in the soil resulted in harvestable sod in 1986, typical for soil seedings.

The late summer seeding was probably superior to other times for several reasons. First, it was very wet in August and September, which did not result in any drought stress normally experienced in late summer seedings. The fall was also very wet, cool, and winter arrived sooner than normal.

Pharmaceutical residue proved to be a better rooting medium than composted horse manure. This was true primarily because of both better fertility (higher in nitrogen) and waste relations. However, by itself, pharmaceutical residue was too soft for normal mowing equipment and required a fly mower.

Further testing is under way at Cornell to examine different rooting media under larger scale production (five acres). It appears that if mechanization of planting and harvest is done, the RIL System of sod production can either increase the total sod produced on the same acreage or keep the same production amount on less acreage.

To a consumer or producer of sod, the RIL System might offer a wider selection of sod in terms of species of grass as well as cultivars. The sod grower could have the ability to produce sod to a bid specification and supply "exotic" or more difficult to grow sods of cool season grasses like tall fescue (without bluegrass), perennial ryegrass and bentgrass.

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PROBLEM MANAGEMENT

by **Balakrishna Rao,** Ph.D.

Pruning azaleas

Problem: *We need some guidelines for timing and proper methods of pruning azaleas in Georgia. We have to deal with small to large, overgrown plants in different places. (Georgia)*

Solution: By proper and selective pruning, the size, appearance and flowering can be improved, and diseased plant parts can be removed. When azaleas are not pruned on schedule, they often tend to produce long stems without many branches and flowers. This can be corrected by "heading back" (reducing in length) and encouraging the development of several side branches. The ideal time for such pruning is soon after flowering to produce strong branching.

These plants should be fertilized and watered as needed to stimulate new growth. This new growth can be "tip pruned" (pinched) by early July so it can produce more lateral branches. This method will produce compact plants which will produce more flowers.

Dead and dying branches due to diseases or winter kill should be removed. For smaller branches use hand pruners, and for larger branches use lopping shears. Cut back into healthy tissues. For larger wounds, application of wound dressing materials may be beneficial.

When plants grow too fast and overgrow the desirable size, or when planning to move large plants to another location, they should be pruned properly to maintain their size and shape. Species of azaleas, like Southern Indian (Indica or Formosa type), grow fast and may require severe pruning. To minimize shock, severe pruning should be done three to four weeks before blooming. The growth produced after this can be further pruned to develop a compact growing plant. Small azaleas should be pruned several times during the growing season to produce a nice compact plant. Maintain good fertilization, watering, and pest management programs to ensure good growth and flowering.

Turf in shade

Problem: *What would be the best way to establish turf under large trees such as maple or oak? Is it better to cut roots and put down soil and seed or simply topdress with soil on existing roots and then seed? Which would be better? (Ohio)*

Solution: The two basic problems are shade and lots of surface-growing roots. Growing turf under trees, like maple and oak that have dense canopies, is possible. Selectively thinning the tree canopy will allow enough sunlight to penetrate through the tree to the grass beneath. Even a slight increase in sunlight may be enough to allow the turf to grow and remain reasonably thick. This process will have to be repeated every few years if the tree is a fast grower and fills in the open spaces.

If pruning the tree still doesn't provide enough sunlight to sustain turfgrass, then a shade-tolerant ground cover should be used in place of grass underneath the tree. Trees that develop surface-growing roots are doing so because of compacted soil and/or poor drainage.

Oxygen is the prime limiting factor in determining depth of root growth. Compacted or wet soils do not have the oxygen-holding capacity to allow roots to grow beyond a few inches of the soil surface. Cutting the roots will only result in more surface roots developing later. Topdressing will further stress the tree by suffocating the sensitive feeder roots.

As little as one inch of soil over the root system can kill the entire tree. Surface rooting is the symptom of a problem, so cutting the roots or topdressing with soil is only a temporary solution. Aerifying the soil with a coring machine or an auger will allow oxygen and water, as well as the root system, to penetrate deeper into the soil horizon. Not only will the growing conditions of the tree be improved, but it will also be easier to maintain turf underneath a tree without surface roots.

Tall fescue seeding

Problem: *We seeded some lawns under shady conditions with a good mixture of certified tall fescue seeds around the second week of September last year. Seeding was done with an aeroseeder and lawns were well watered after seeding and during establishment. However, we are seeing a large number of ¾-inch bare spots now. Will these areas fill in? Do we have to reseed now? Is it better to wait till spring? (Ohio)*

Solution: Since you have used certified seeds with a good percentage of germination and used an aeroseeder, you should have obtained good results. Several possibilities exist as to the cause of the problem you are experiencing. If the soil was not prepared well, some of the tree roots might have prevented proper seeding and establishment.

Another possibility might be that seeds were washed off or rotted, or the area remained dry at times. Tall fescues spread slowly by producing tillers, which grow laterally, resulting in a bunch-type growth habit. Because of this growth habit, ¾-inch bare spots may not fill in for a long time. To correct the situation you can consider dormant overseeding, or better yet, wait until spring and see how much of an area may need reseeding and then overseed. Maintain good watering throughout the germination and establishment period for better results.

Balakrishna Rao is Director of Lawn Care Technical Resources for The Davey Tree Co., Kent, Ohio.

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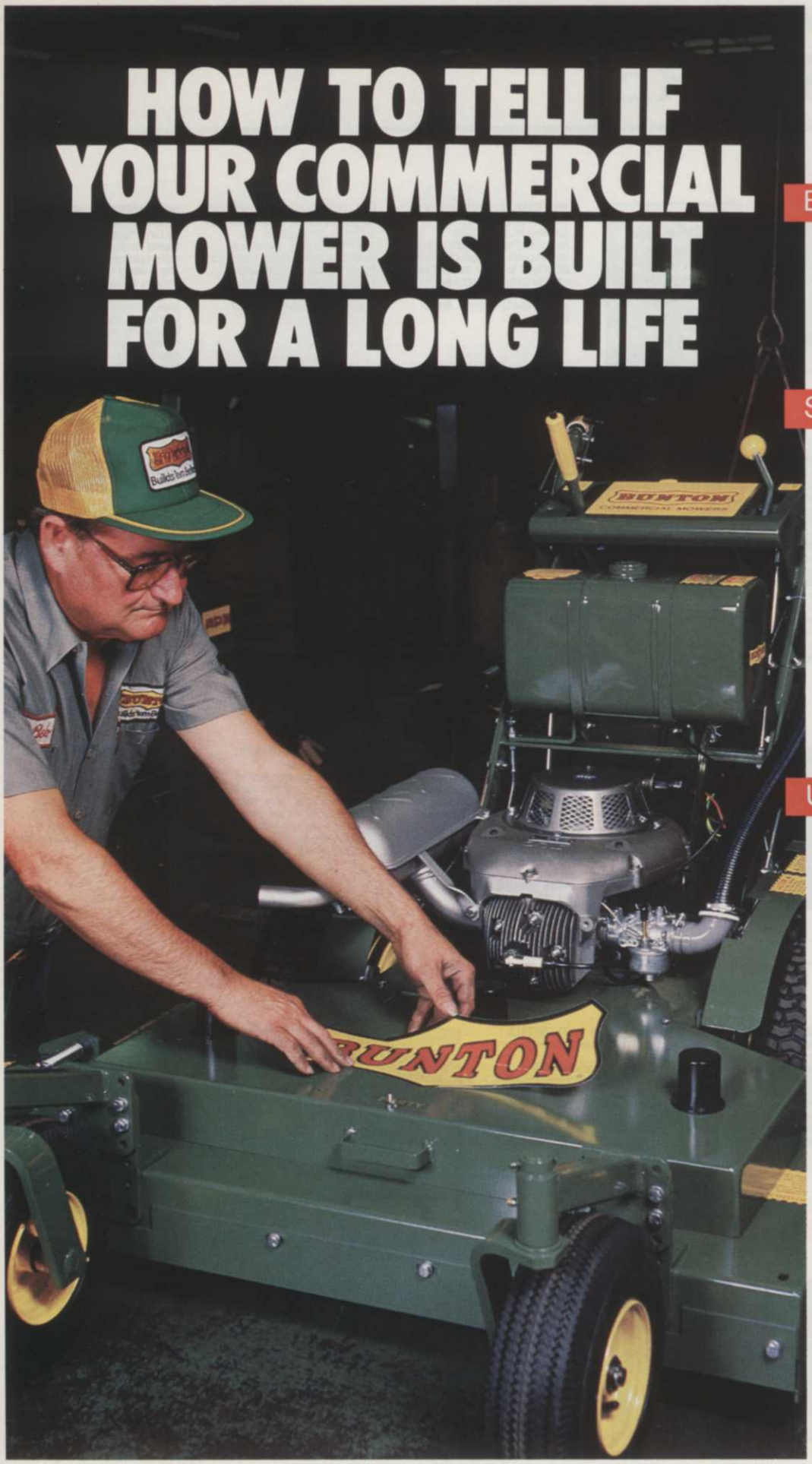

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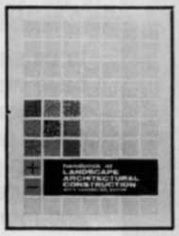

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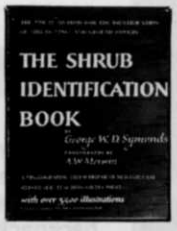

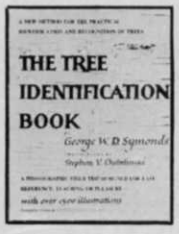

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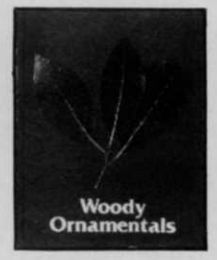

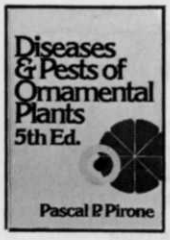

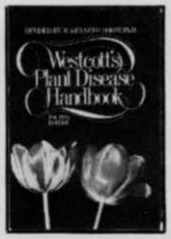

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