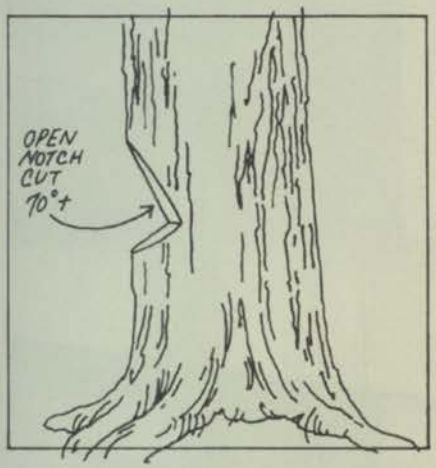
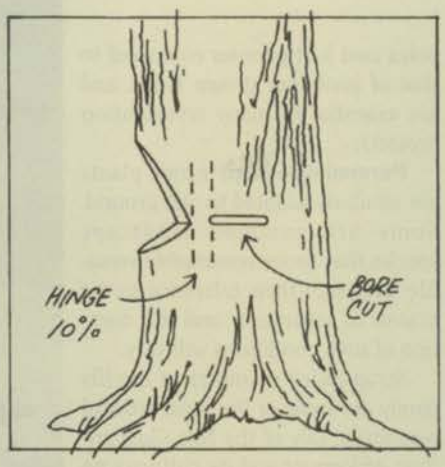
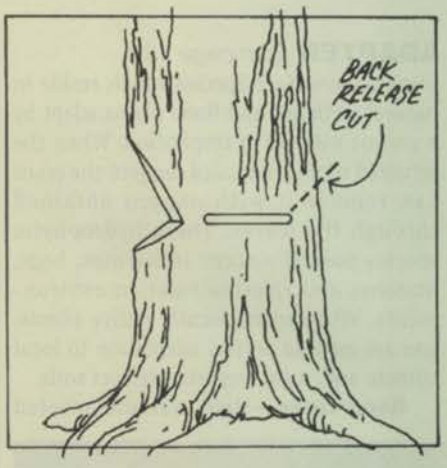


The open notch should be cut on the side of the tree in the direction of the planned fall. It should be cut at 70 degrees or more, to allow the hinge to work and guide the falling tree.



Begin the bore cut from the side of the tree, parallel to the face notch. Do not cut without first rotating into the wood. Trying to plunge the bar straight in may cause kickback.



To finish felling the tree, cut the holding wood, moving from the back side of the tree toward the front.

Be careful of pressures and binds when working around the downed tree. That's a whole new subject within itself for later discussion.

Stability counts—Tree care professionals should easily see the benefits this method provides over conventional methods. Use of the holding wood in place as part of the back-release helps keep the tree stable until the final cut.

Also, the holding wood will keep the bar from getting pinched, wiht the holding wood acting as a support. The method also reduces the chance you will cut all the way through the hinge before the tree begins to fall. This will reduce the chance that the tree falls so quickly that it jumps off the stump and possibly back at crew members.

Lastly, the back-release method keeps the bar at the back of the tree, rather than deep into the trunk. That makes it easier to walk away using your planned escape route when the tree falls.

All these combined will make it easier for you and your crew to come safely away, feeling less fatigue, from a job efficiently done.

Videos of this open notch and bore cut technique are available through many local chain saw dealers and Forest Applications Training, Inc.

—The author is president of Forest Applications Training, Inc., in Hiram, Ga., and co-creator of "Game of Logging" and "ArborGames," safety and applications training programs for tree professionals. He has been training professional chain saw operations for more than 10 years.

Adapted plants for wet ground

Proper selection is the key to long life, no matter what the cultural conditions.

by Maureen Gilmer

■ It's 100 degrees, the soil surface appears dry and cracked, the plant wilts. So you pour on the water and the plant wilts even more.

If you've struggled with a very high water table, or an impervious hardpan, or low-lying ground subjected to periodic inundation, you may have already experienced these frustrating symptoms.

The cause: root death due to anaerobic soil conditions where water displaces vital oxygen.

In order to be sure that the plant died from poor drainage, inspect the root system for the characteristic peeling skin, blackened roots and unpleasant smell. This will rule out nematodes and other root diseases which can display similar wilt symptoms in plants.

Once poor drainage is diagnosed, first try mechanical remedies like French drains, diversion ditches, grading alterations or constructing elevated planters. But if this isn't possible, or the problem is widespread, choose replacement plants that won't succumb to the same fate.

Why can some plants like willow stand saturated ground, even with much of the

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plant underwater? Species which reside in natural wetlands and flood plains adapt by a unique method of respiration. When the satuated roots are denied oxygen, the plant can replace it with oxygen obtained through the leaves. These hydrophytic species normally occur in swamps, bogs, marshes and riverine riparian environments. When using locally native plants, you are assured perfect adaptation to local climate and, most importantly, wet soils.

Good trees—Many wetland adapted species are already part of the landscaper's palette: magnolias from high water table Southern states; maples and liquidamber from the bottomland hardwood forests; cedars, tamarack and spruce from Northern bogs; sycamore and cottonwood from seasonally dry stream beds of the West; and dogwood and birch from Eastern riparian habitats.

Other well-known genera of native wetland species include willows *(Salix)*, ash *(Fraxinum)*, oak *(Quercus)*, alder *(Alnus)* and poplar *(Populus)*.

Willows and poplars are ideal ornamental trees in high water tables; indeed, they fail to thrive except under such conditions. Both groups develop a web-like network of small roots which help secure them to the often-eroding banks of riverbank riparian habitats under high water flows. When grown in containers, they quickly become pot-bound, and when planted out have little ability to hold up even under mild flooding.

Great success has been achieved by planting these trees as unrooted cuttings or poles from 12 inches to 15 feet long during the dormant season, with about 30 percent of each pole buried in a post hole. This assures excellent stability and a massive root system in a very short time. Better yet, poles cost just pennies compared to that of container grown stock, and are essential in many revegetation projects.

Perennials—Many exotic plants are similarly adapted to wet ground. Some are common landscape species that prove remarkably versatile, although their tolerance to the season of saturation and the duration of such conditions will vary.

Strap-leafed members of the lily family are some of the most colorful perennials. Lily of the Nile *(Agapanthus africanus)* and its cultivars no doubt originated on the flood plain of the Nile and have relatively shallow root systems which lie above the most saturated soils. Daylilies *(Hemerocallis spp.)* bear a similar habit with hundreds of colorful varieties. The common canna lily *(Canna generalis)* also thrives in poorly-drained conditions as its tuberous root is born high in the soil. And often overlooked, but a magnificent flower after dark, the calla lily *(Zantedschia spp.)* will reach startling proportions with plenty of water.

Horsetail grass (above) is becoming a popular water garden marginal plant. Below, bamboo and papyrus grow in a natural pool. At left are canna lilies. Daylilies are pictured on page 15.

Many plants like iris and ferns include both arid ground and wetland species, so it's essential that you recognize the difference. For example, Dutch iris and German iris both require fast drainage, but their Japanese relatives, kaempferi and Louisiana hybrids are true marginals, thriving around the edges of flooded rice paddies in their Asian countries of origin.

With the new interest in water gardens, these and other marginal plants are now more widely available.

The enormous family of grasses and sedges contain many true native hydrophytes which inhabit marshes everywhere. Many are exotics so well-adapted that they have become dangerously inva-

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Widely available plants for wet ground

TREES

Scientific name	Common name
Acer spp.	maples
Alnus spp.	alders
Betula spp.	birches
Casuarino spp.	beefwoods
Celtis spp.	hackberries
Cornus florida	flowering dogwood
Eucalyptus citriodora	lemon-scented gum
Eucalyptus robusta	swamp mahogany
Eucalyptus rudis	flooded gum
Fagus grandifolia	beech
Fraxinus latifolia	Oregon ash
Fraxinus pennsylvanica	green ash
Ilex opaca	American holly
Ilex verticillata	winterberry
Larix alricina	American larch
Liquidamber styraciflua	sweetgum
Magnolia grandflora	Southern magnolia
Magnolia virginiana	sweetbay magnolia
Melaleuca quinquenervia	cajeput tree
Myoporum laetum	myoporum
Pinus elliotti	slash pine
Pinus glabra	spruce pine
Pinus strobus	white pine
Pinus taeda	loblolly pine
Platanus acerifolia	London plane tree
Platanus racemosa	California sycamore
Populus spp.	poplar, aspen
Prunus serotina	black cherry
Quercus spp.	Southern oaks
Rhus spp.	sumacs
Roystonea spp.	royal palms
Sabal palmetto	cabbage palm
Salix spp.	willows
Sambucus spp.	elderberries
Sassafras albidum	sassafras
Ulmus americana	American elm

PERENNIALS

Scientific name	Common name
Acontium spp.	monkshood
Agapanthus spp.	lily of the Nile
Aguga spp.	carpet bugle
Alocasia	elephant's ear
Aster spp.	Michaelmas daisy
Astilbe spp.	false goat's beard
Canna generalis	canna
Centranthus ruber	red valerian
Echinacea purpurea	purple coneflower
Hemerocallis	daylily
Hibisucs moscheutos	rose mallow
Hosta spp.	hostas
Iris spp.	Japanese/Siberian irises
Lobelia cardinalis	cardinal flower
Lythrum virgatum	purple loosestrife
Mentha spp.	mints
Myosotis scorpioides	forget-me-not
Phormium tenax	New Zealand flax
Primula spp.	primroses
Zantedschia spp.	callas

FERNS

Scientific name	Common name
Asplenium trichomanes	toothed wood fern
Athyrium filix-femia	lady fern
Athyrium nipponicum	Japanese painted fern
Camptosorus rhizophyllus	walking fern
Lygodium palmatum	climbing fern
Osmunda cinnamomea	cinnamon fern
Osmunda claytoniana	interrupted fern
Osumnda regalis	royal fern
Thelypteris palustris	marsh fern
Woodwardia spp.	chain ferns

Source: the author

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sive in some North American wildland ecosystems. But the tenacity of pampas-grass, bamboos, papyrus, horsetail and New Zealand flax are in step with the growing popularity of ornamental grasses, and they solve drainage problems as well.

Natives—If you must contend with high water and wet ground during the summer growing season, solutions are all around you. Native plants provide a wealth of species in the U.S. The environmental movement to restore damaged wetlands has stimulated new sources of native plants for the landscape trade, and growers specializing in water garden plants combine to provide us with new and exciting alternatives.

As we all struggle with the recent spate of unusual weather (an abnormally wet winter and spring in the West, and record high summer water in the Midwest and South), it's wise to pay more attention to wet ground species both native and exotic.

Until the weather settles down for a while and returns to its more benign water levels, it makes sense to plan for a wet future in order to reduce the labor demands and costs of continually replacing root-damaged plant materials.

—The author has written "Living on Flood Plains and Wetlands" (Taylor, 1995). For immediate availability of native wetland plants of North America, obtain a plant and supplies catalog from Southern Tier Consulting, 2677 Rt. 305, P.O. Box 30, West Clarksville, NY 14786; (716) 968-3120.