

The Challenging Garden and Plants for difficult sites

Faced with spots that are too hot, dry, wet, rock hard or windy?
Here are practical solutions and plants for impractical garden areas.

Introductions

1. First things first:

Be sure it's a challenging garden, not just a difficult gardener!

2. Many challenging sites are difficult for more than one reason.

- A. Focus on challenges in high-priority spots.
- B. Identify and alleviate the limiting factor whose correction will help most.
- C. Embrace continual change: new species, new layouts.

3. Many solutions to challenges involve changes in:

- A. Structures: Grade changes, drains, irrigation systems.
- B. Soil preparation techniques and amendments.
- C. Species, to use those adapted to or tolerant of the limiting factors.
- D. Maintenance, so it's done in ways to moderate effects.

For each type of difficult site, we'll look at all those aspects...

E. ...and: **What to do *right now this year* to improve that garden.**

Pg. 1 - Overview: Answers to *all* difficult sites

Pp. 1-2 - Recommended reading

Pp. 2-3 - Wet sites: Managing, designing, plant sampler

Pp. 4-5 - Dry sites: Expectations, soil prep, care plant selections

Pp. 6-7 - Windy sites: Effects, changing structures, soil, care; plants

Pp. 7 - Hard packed soil: Prevention, soil prep, plant selections, care

Pp. 8 - Extreme temperatures: Effects, modifications, plant choices

Pp. 9-10 - Salt-exposed sites: Effects, changes, soil prep, care, plants

Pg. 10 - Key to detailed plant lists

Pp. 10 - 24 - Detailed plant charts and lists, key on pg. 10

4. Recommended resources:

What's Coming Up, Janet's free weekly newsletter via JMaxGarden@aol.com

"American Gardening Series: Waterwise Gardening", Lauren Springer,

Prentice Hall Gardening (Simon & Schuster), NY, 1994

"Lakescaping for Wildlife and Water Quality", Carrol L. Henderson, Carolyn

J. Dindorf, Fred J. Rozumalski, ©State of Minnesota, DNR, 800-657-3757

"Native Trees, Shrubs and Vines for Urban and Rural America", Gary

Hightshoe, Van Nostrand Reinhold, NY, 1988

"Perennials and Their Garden Habitats", Richard Hansen and Friedrich Stahl,

Timber Press, Portland, Oregon, 1993

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"Plants for Problem Places", Graham Rice, Timber Press, Portland, 1988
"Right Plant, Right Place" Nicola Ferguson, Summit Books, NY, 1984

And type these URLs into your Internet browser:

plants.usda.gov USDA plant database; plant native ranges and habitats

<http://mnfi.anr.msu.edu/communities/> (Michigan Natural Features Inventory; click on the type of environment, such as dry northern forest, for details of the community including a list of naturally occurring plants)

wisplants.uwsp.edu/wildflower.html plant communities, by habitat

illinoiswildflowers.info allows view of plants by site

inhs.uiuc.edu/~kenr/prairietable2.html List of roadside-loving wildflowers including dry/wet notations, from The Illinois Natural History Survey site

Wet sites

5. Be sure *wet* is what you face.

A. Know what "wet" is and determine why it exists on your site:

1. Soil air spaces fill, stay filled with water.
2. Compaction slows drainage; drains blocked or poorly made.
3. Hard pan exists, natural or man made.
4. It's a natural wetland: High water table, springs, flood plain.
5. To know it's really wet:
 - Water remains +24 hours in 18" deep drainage test hole.
 - Sour smell as you dig.
 - Below surface: Gray or blue soil, sometimes with rusty mottling.
 - Mosses, self-heal, creeping buttercup, hogweed.

B. Don't be fooled: *Moving* water in soil is OK; standing, stagnant water is not.

C. Recognize what the growing conditions are there:

1. Low oxygen in soil.
2. Low pH and slow decomposition; may cause nutrient deficiencies.
3. Humidity; plants are bathed in atmospheric moisture.
4. May be seasonably variable, with wet and dry season.

6. Choose species for water *and* light. Bog (sunny) or swamp (shady).

7. Form realistic expectations for a wet area.

- A. Can you make a wet area dry? Should you?
- B. Aerate. Remove or break barriers to drainage.
- C. Fill low areas, make raised beds.
- D. Drains: Tiles 3-4' deep (or surface drains) minimum 1:100 slope.

8. Preparing wet soil for planting.

- A. Raise the bed:
As many inches as water still in drainage test hole +24 hours.
- B. Clear and replant.
Dig, kill or smother. Loosen, don't till. Plant small, in pockets.
- C. Amendments: Turface-type materials, sandy loam.

9. Selecting and planting wet-site plants.

- A. Recognize ideal plants:
 - 1. Marginal-, emergent-, semi-aquatic plants.
 - 2. Visit similar sites, record plant groups.
 - 3. Observe individual plants -- root and leaf adaptations for wet.
- B. Be aware of wet area design challenges:
 - 1. Shifting locations of elements: Simply the nature of suitable plants.
 - 2. Spring color gaps, winter messiness.
 - 3. Near impossibility of creating or maintaining a crisp edge.
 - 4. Naturalized plantings often best: Plant masses, let species weave.
- C. Start with young/small/bare root plants whenever possible. Wetland species produced in well drained field or pot must adapt.

10. Maintaining the wet garden.

- A. Weeding: Do this in early spring, mulch it, leave it until fall.
- B. Fertilizing: Usually unnecessary.
- C. Slugs and snails can be a problem. Live with it.
- D. Choose which species will be single specimens; restrain these.
- E. Late fall: Cut down all herbaceous plants, fork soil, cover with 2-3" mulch.

11. The best solution for the wet site *right now*:

Containers, or true wet site plants.

Sampler of Perennials, Annuals, Shrubs and Trees for Wet Sites

Plant name	height:	color:	blooms in:	notes:
Filipendula rubra (Queen of prairie)	3-5'	pink	July	marginal, half sun to sun
Trollius europaeus (globeflower)	18-36"	yellow	May-July	marginal, half sun to sun
Chelone obliqua (turtlehead)	2-3'	pink, white	July-August	marginal, half-sun to shade
Rodgersia species (rodgersia) R. aesculifolia, R. pinnata	2-3'	white, pinks	June-July	marginal, shade to half-sun
Physocarpus opulifolius (ninebark)	3-9'	white	June	marginal, sun to half-sun
Sambucus canadensis (elderberry)	8'+	white	June	marginal, sun to shade

For more plant suggestions, continue to the full list of Plants for Difficult Sites, pages 10 - 24.

Dry sites

12. What is dry? Why would it happen here in a mesic region?

- A. Too little water reaches the soil or the soil cannot hold water.
- B. Soil may be excessively well drained or sandy / gravelly.
- C. Water sources may be blocked.
- D. Efficient, competitive plants may be already established there.
- E. Compaction at surface may prevent water infiltration.
- F. Proximity to a building or substantial wall: Blocks *and* absorbs water.

13. What growing conditions are there in a dry site?

- A. Drought -- a given. Year-round or seasonal.
- B. Nutrient-poor soil if it's excessively well drained sand or gravel:
- C. May be high pH (alkaline).
- D. Few to no plants growing there.
- E. Hard pan may form at water penetration depth in irrigated dry site.

14. Realistic expectations when "xeriscaping" a dry site.

- A. Irrigation for dry sites is usually not a temporary measure.
- B. Point irrigation often best: Water individual plants
- C. When engineering a fix:
 - 1. If you lower a site, expect loss of air circulation and its consequences.
 - 2. If you add 10% organic matter (OM), keep adding moisture and OM.
 - 3. If you slow or stop drainage to conserve water, deep-rooted dry-area species won't grow there.

15. Preparing the soil in a dry area.

- A. Amendments: OM, polymers, clay.
- B. Introduce soil animals plus water to help in soil aggregation.
- C. Remove *every* weed. Sounds simple, but:
 - 1. Dry plant roots run deep, often brittle.
 - 2. Be considerate of "keeper" woody plants:
 - Minimal root disturbance; follow a plan for root pruning.
 - Root barriers can mean death for some plants in dry areas.

16. Selecting plants and planting the dry area.

- A. Desert species:
 - 1. May be very hardy even if native to a more southern area.
 - 2. Often cannot abide winter wet.
 - 3. May be larger and very aggressive in irrigated conditions.
- B. "Reading" the plants:
 - 1. Recognize (and accept) leaf and root adaptations for heat, drought.
 - 2. Local, public dry sites? Dunes, woods? Go! Carry a notebook.

- C. Design challenges in dry sites:
1. Space is always an element. Dry areas are not lush.
 2. Coarse textures sometimes lacking.
 3. Summer flower color may be minimal.
 4. Gray, silver, pale greens and light soil will dominate scene.
- D. Aim for a natural look in dry areas. Easy, pleasing, practical.
1. Make wise use of space between plants or plant masses.
 2. Inorganic mulches often best for plants, if tougher for gardener.
 - Hairy leaves healthier on warm, dry rock.
 - Gardener must move inorganic mulch to add organic matter.
 3. Dwarfed, contorted forms often pleasing.
- F. Ease the nursery-grown plant into its new root configuration.

17. Special maintenance in a dry area.

- A. Water by weeper hose, sunken reservoirs, subsurface irrigation, inverted wine bottle, containers with wicks.
- B. Weeding: Establish zero tolerance for these competitors.
- C. Fertilizing: Combine slow release and water soluble, by observation.
- D. Pests: Look out for sucking insects; fence our herbivores.
- E. Winterizing -- leave organic matter in place.

18. The best solution for the dry site *right now*:

Soaker hose, and individual water supplies (wine bottles!) for new plants.

Sampler of Perennials, Annuals, Shrubs, Vines and Trees for Dry Sites

Plant name	width x ht.	color:	blooms in:	notes:
Lithospermum carolinense (hairy puccion)	1' x 1-2'	yellow-orange	late June	native to dry areas, upper MI hoary puccion L. canescens smaller
Nepeta spp. & hybrids (catmint)	18-24" x 18-24"	violet fragrant	late May-June will repeat	full sun; heat OK
Stachys macrantha, S. officinalis (big betony and lambs ear)	18-18" x 18"	pink/mauve	June will repeat if cut	full sun; heat OK S. grandiflora clump forming
Actaea rubra (red baneberry)	18-30" 18-30"	white fl red berry	late May-June July-August	half-sun
Symphytum grandiflorum (large-flowered comfrey)	18-12"	pale yellow	May	half sun to sun; heat OK
Gomphrena globosa (globe amaranth)	15" x15"	maroon, white, pink	good dried flower	full sun
Caryopteris x clandonensis (blue beard, blue mist spirea)	3-5' x 3-5'	blue, August twigs & grey foliage	full sun to half sun fragrant	dieback shrub often grown as perennial
Myrica pennsylvanica (bayberry)	5-8' suckering	insignificant flower fragrant foliage	semi-evergreen	full sun to half-sun; salt OK, heat OK need male and female for fruit (birds)

For more plant suggestions, continue to the full list of Plants for Difficult Sites, pages 10 - 24.

Windy sites

19. Wind's effects:

- A. Abrasion damage: Even tough species may be deformed & battered.
Recognizing it: Crush a new leaf. Fold a leaf over on itself upward, another downward. Rub 30 seconds. Note symptoms 24 hrs later.
- B. Dehydration: Water vapor cloud around leaves blows away.
- C. Tip dieback and plant deformity. Root damage from rocking of crown.
- D. Erosion.
- E. Exposed soil is cold soil, slows root growth.
- F. Fewer, smaller, later flowers, fruit (raspberries, beans bear 50% less).

20. Structural modifications to reduce wind effects.

- A. Reduce wind with windbreak.
 - 1. 60-80% solid fencing. Height to length ratio at least 1:10.
 - 2. Windbreaks: wind-resistant spp., shrubbier, lower, deciduous on windward side to tallest evergreen on lee side.
 - 3. Reduces wind speed for distance 2-5x height of the windbreak on windward side, up to 30x height on lee side.
- B. Temporary windbreak as wind-resistant plants become established.
- C. Lower the site -- trench gardening.

20. (Cont'd) Structural modifications to reduce wind effects.

- D. Watch for frost pocket creation uphill; heat trap in summer south, west.
 - 1. Ground level gap below windbreak can let cold air roll through.
 - 2. For summer cooling: Design windbreak with removable sections.

21. Soil preparation and amendments to lessen wind's effects.

- A. Add organic matter.
- B. Mulches essential -- especially living mulches. No- or low-blow mulch.

22. Special maintenance techniques for windy sites:

- A. Staking -- lean a single stake *into* the wind.
- B. Insulation, anti-transpirants (Wilt-pruf, etc.) for evergreens.
- C. To combat cold soil: solarize in spring, or delay planting.
- D. Encourage wider root spread for more firm anchorage.
- E. Protect pots and exposed windward sides of retaining walls.
- F. Go carefully in pruning to even up wind-distorted growth.

23. The best solution for the windy site *right now*:

Wind tolerant species with an up-wind screens and individual water supplies.

24. Sampler of wind-tolerant species (good windbreak species).

- A. Plant adaptations to windy sites.
 - 1. Tiny-, gray or silver leaves; ground-hugging profiles, tap roots.
 - 2. Found on seashores, eastern shores of inland lakes, hilltops, land between breaks in natural windbreaks.

- B. Trees, shrubs, perennials and annuals for windy sites:
 - Hawthorn (*Crataegus spp.*)
 - Beauty bush (*Kolkwitzia amabilis*)
 - Leadplant (*Amorpha canescens*)
 - Gaura (*Gaura Lindheimeri*)
 - Russian sage (*Perovskia spp.*)

For more plant suggestions, continue to the full list of Plants for Difficult Sites, pages 10 - 24.

Sites with hard-packed soil

25. Downtrodden sites: The effects of foot traffic.

- A. Foot (and paw) traffic can cause trouble as from heavy equipment.

26. Structural modifications to reduce damage from foot traffic.

- A. Barriers to direct feet away, bar entry, confine to path.
- B. Path of recycled rubber mulch or boardwalk.

27. Soil preparation where the soil is hard packed.

- A. Break the hard pan.
- B. Raise the bed.
 - Loosen the surface to roughen it; prevents perched water table.
- C. Incorporate Turface, rubber, high-lignin materials or install geo-grid.

28. Looking for compaction-tolerant species.

- Tap root.
- Thick, shallow roots.
- Found in natural pathways, soil newly exposed after glacial recession.

29. Special maintenance tactics for downtrodden soil.

- A. Mulch over the soil. (8" withstands 10 passes of bulldozer.)
- B. Loosen soil regularly, incorporate organic matter.

30. The best solution for the downtrodden site *right now*:

- Mulch, fence and a grouping of containers.

31. Sampler of plants for sites with compacted soils.

- Ginkgo (*Ginkgo biloba*)
- Hackberry (*Celtis occidentalis*)
- Deutzia (*Deutzia spp.*)
- Snowberry (*Symphoricarpos orbiculatus*)
- Aster (*Aster spp. esp. A. novae-anglaie*)
- Helen's flower (*Helenium autumnale*)
- Sunflower (*Helianthus annua*)

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Sites with temperature extremes.

32. Hot-to-cold sites: Very wide, fast daily temperature changes.

- A. Recognize effects of extreme temperature changes:
 - 1. In spring: cambium damage, needle tip brown, needle cast, holey leaves (in maples, others).

33. Structural modifications that can moderate temperature change.

- A. Planting against heat-absorbent walls.
- B. Erecting baffle between plants and heat-reflecting wall.
- C. Planting or erecting shade screens, roofs to stop frost.

34. Soil preparation and amendment.

- A. Mulch.
- B. Perfect drainage.

35. In desert and high mountains, adaptations for temperature extremes:

- A. Escapers (annuals sprout & complete life during moderate season).
- B. Evaders:
 - Perennials that go dormant during toughest times.
 - Ground huggers use earth's warmth.
- C. Resisters:
 - "Salty" cells -- natural antifreeze.
 - Manufacture special protein and a pigment that redirect light.
 - Drop leaves, green bark photosynthesizes.
 - Deep tap root allows water content change even in surface freeze and drought.

36. Special maintenance tactics.

- A. Insulation for evergreens.
- B. Mulch over the soil.

37. The best fix for the temperature-extreme place *right now*:

Shade screens and mulch.

38. Sampler: Trees, shrubs, perennials, annuals for hot-to-cold sites.

American hornbeam/blue beech (*Carpinus caroliniana*)
Birch: sweet/cherry, paper (*Betula lenta*, *B. papyrifera*)
Crabapples, prairie crabapple (*Malus* varieties, *M. ioensis*)
Alpine currant (*Ribes alpinum*)
Kerria (*Kerria japonica*)
Globe thistle (*Echinops exaltatus*)
Border jewel (*Polygonum affine*)
Yucca (*Yucca* spp.)

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Salt-exposed sites

39. Salt's effects on soil and plants.

- A. Dehydration of tissues adjacent to salt or salty soil.
- B. Sodium and chlorine separate and build up in soil.
 - 1. Sodium destroys soil structure: compaction, no oxygen, puddling.
 - 2. Chlorine easily absorbed by plants, builds to toxic, scorching levels.
 - 3. Deficiencies: sodium blocks uptake of magnesium and potassium.
- C. Reduction of hardiness as salt invades intercellular spaces: tip dieback.
- D. Reduced vigor: stunted growth, yellow foliage, premature fall color.
- E. Lower seed germination rate in salty soil.
- F. Young foliage and roots most susceptible to damages.

40. Structural modifications to reduce salt damage:

- A. Windbreaks.
- B. Significant change in elevation -- higher areas, less salt (cliff vs. beach).

41. Salt: Soil prep techniques and amendments for salt-exposed sites.

- A. Trough the edge to accept some run-off but contain it and direct it.
- B. Bank edges or raise beds to stop slush-spread over soil.
- C. Test soluble salts, treat if >1,000 ppm in sand or >2,000 ppm in loam or clay.

42. Salt-tolerant plant species.

- A. Plant adaptations to salty sites:
 - 1. Waxy, thick, water-sloughing foliage.
 - 2. Grey and silver leaves.
 - 3. Buds submerged in bark or resin coated.
 - 4. Look to seashore (saltspray tolerance), saltwater marshes, fringes of Dead Sea, Great Salt Lake, irrigated western U.S. deserts, dunes (different species on primary dunes & sheltered secondary dunes.)
- B. Trees, shrubs, perennials annuals for salty sites
 - Kentucky coffeetree (*Gymnocladus dioica*)
 - Saltspray rose (*Rosa rugosa*)
 - Summersweet (*Clethra alnifolia*)
 - Artemisia
 - Northern sea oats (*Chasmanthium latifolium*)

For more plant suggestions, continue to the full list of Plants for Difficult Sites, pages 10 - 24.

43. Salt: Special maintenance techniques for salt exposed sites.

- A. Protect the soil from run off with curbs or interceptor swales. Check run-off barriers or check drains before each winter.
- B. Airy mulch in winter, removed in spring. (Big grasses, cut in spring.)
- C. For winter: Flatten watering craters near salt-spray areas.

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- D. Use calcium chloride (8x \$), sand, sand and urea, or sawdust instead of sodium chloride for deicing. Drop de-icer, don't throw it or push it into beds; when snow piles accumulate, truck them away.
- E. Rinse foliage after heavy salt spray and in early spring.
- F. Leach soil in spring to purge salt: apply 2" water over 2-3 hours, repeat after 3 days. (May be necessary to install drains to accommodate this water. At seashore, there may be a highly porous sand layer under any topsoil.)
- G. Add calcium (gypsum) to bind sodium, then leach them both away.
- H. Protect trees, shrubs while young -- older, established are less damaged
 - If use protective burlap, cloth should not touch foliage.
- I. Add organic matter to soil often to rebuild structure, increase porosity.

Plants for Difficult Sites: Lists by site

Perennials for Sunny to Half-Shady Wet Sites, pages 10 - 12

Perennials for Shady Wet Sites, pages 12 - 13

Annuals for Wet Sites, page 13

Shrubs for Wet Sites, page 13

Trees for Wet Sites, page 13

Perennials for Sunny Dry Sites, pages 14 - 15

More Plant Ideas: Dry Sunny Sites, page 15

Perennials for Shady Dry Sites, page 16

Annuals for Dry Sites, page 17

Trees for Dry Sites, page 17

Shrubs and Vines for Dry Sites, page 18

Trees, shrubs, perennials and annuals for windy sites, pages 19- 20

Plants for sites with compacted soils: Trees, Shrubs, Perennials, page 21

Plants for extreme temperature changes page 22

Trees, shrubs, perennials, turf and annuals for salty sites pages 23 - 24

Perennials for Sunny to Half-Shady Wet Sites

4 to 6 or more hours direct sun every day:

Plant name	height:	color:	blooms in:	notes:
<i>Aconitum</i> species (monkshood)	2-5'	blues	July-August	marginal
<i>Acorus calamus</i> (sweet flag)	2-3'	tiny	July	emergent and marginal; fragrant rush-like leaves
<i>Ajuga reptans</i> (ajuga)	6-10"	blue, white, pink	May	marginal; variegated leaves
<i>Aquilegia canadensis</i> (columbine)	2-4'	many	June	marginal
<i>Aruncus dioicus</i> (goatsbeard)	3-4"	white	June-July	marginal

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Perennials for Sunny to Half-Shady Wet Sites (Cont'd.)

4 to 6 or more hours direct sun every day:

Asclepias incarnata (swamp milkweed)	36-48"	lilac	June-July	marginal
Astilbe species (false goats beard)	12-36"	white, pinks	June, July, Aug.	marginal
Astrantia species (masterwort)	"	white		marginal
Calla palustris (bog arum)		white	June-July	red berries follow; marginal and emergent
Caltha palustris (marsh marigold)	12-18"	yellow	May-June	marginal, emergent; summer dormancy
Camassia cusickii (Indian turnip)	18"	blue	May-June	marginal
Chelone obliqua (turtlehead)	2-3'	pink, white	July-August	marginal
Cimicifuga species				
C. racemosa (bugbane)	3-5'	white	June	marginal
C. simplex (autumn bugbane)	3-4'	white	August-Sept	marginal
Eupatorium species				
E. maculatum (Joe Pye weed)	2-6'	purple	July	marginal and emergent
E. perfoliatum (boneset)	2-4'	white	July	marginal and emergent
Ferns: Osmunda species				
Ostrich fern	2-4'			marginal, invasive
Royal fern	3-4'+			marginal and emergent
Interrupted fern	1-2'			marginal, acid
Filipendula hexapetala (meadowsweet)	18-24"	white	June	marginal
Filipendula rubra (Queen of prairie)	3-5'	pink	July	marginal
Filipendula ulmaria (dropwort)	18"	white	June	marginal
Hemerocallis species (daylily)	1-6'	no blues	June-July others	marginal; isolate orange tones from others
Hibiscus moscheutos (hardy hibiscus)	3-5'	white, red, pink	July-August	marginal
Hosta species H. plantaginea, H. undulata	12-24"	white, lilac	July-August	marginal
Houttuynia cordata				marginal
Insectivorous plants Such as sundew and pitcher plant				marginal
Iris species I. kaempferi, I. laevigata, I. pseudacorus, I. sibirica	24-36"	many	May, June, July	I. kaempferi: no standing water during winter
Ligularia species	3-5'	yellows	June-July	marginal
Lobelia species (L. cardinalis: cardinal flower; L. siphilitica, Great blue lobelia)	18-36"	red, blue	July, August	marginal
Lysimachia nummularia aurea (golden coins)	4"	yellow	June	spreads; moist soil
Lysimachia punctata (loosestrife)	2-3'	yellow		
Mentha aquatica (water mint)		violet		
Miscanthus sinensis (Chinese Silver grass and varieties)	4-10'	plumes	July-August	marginal; many varieties with striped leaves
Monarda species (bee balm)	2-3'	red, pinks	June-July	marginal
Myosotis scorpioides (creeping forget me not)	4-6"	blue	June-August	true perennial; fast in moist soils

Perennials for Sunny to Half-Shady Wet Sites (Cont'd.)

4 to 6 or more hours direct sun every day:

Phalaris arundinacea (ribbon grass)	2-3'	sprays	July	marginal; variegated one is nice; all are invasive
Polygonum species knotweeds: P. affine 10", P. Bistorta 'Superbum' 24", P. cuspidatum 'Compactum' 36"	12-36"	pink, red	July-August	can be invasive in good soil & sun
Primula species Candelabra primroses P. beesiana, P. japonica	1-2'	all	May-June	marginal
Ranunculus species (buttercup)	1-3'	yellow	May-June	marginal; invasive
Sagittaria latifolia (arrowhead)	24-36"	white	July	arrow shaped leaves; emergent and marginal
Sambucus ebulus (dwarf elder)	3-4'	white	June	marginal
Thalictrum species (meadow rue)	2-6'	white, pinks	June-July	marginal
Trollius europaeus (globeflower)	18-36"	yellow	May-July	marginal
Typha species (cat-tail) (T. angustifolia, T. minima)	1-5'	tiny		emergent and marginal; species listed are less invasive than others

Perennials for Shady Wet Sites

2-4 hours direct sun each day (full sun in spring)

Plant name	height:	color:	blooms in:	notes:
Acorus calamus (sweet flag)	2-3'	tiny	July	emergent & marginal; fragrant leaf
Ajuga reptans (bugle, ajuga)	6-10"	blue, pink	May	marginal
Aquilegia canadensis (columbine)	2-4'	many	June	marginal
Arisaema species (jack in pulpit)	6-24"	tiny	June	marginal
Astilbe species (false goats beard)	12-36"	white, pinks	June, July, Aug.	marginal
Carex species (___ sedge)	1-2'			marginal; some variegated
Chelone obliqua (turtlehead)	2-3'	pink, white	July-August	marginal
Cimicifuga species C. racemosa (bugbane) C. simplex (autumn bugbane)	3-5' 3-4'	white white	June August-Sept	marginal marginal
Cypripedium calceolus (yellow lady's slipper)	10"	yellow	June	marginal; protected
Erythronium spp. (trout lily)	6"	yellow	April-May	marginal; summer dormancy
Ferns: Osmunda species Ostrich fern Royal fern Interrupted fern	2-4' 3-4'+ 1-2'			marginal, invasive marginal and emergent marginal, acid
Hosta species H. sieboldiana, H. glauca, H. undulata	12-36"	lilac	July	marginal
Lilium canadense (wild lily)	3-4'	orange	July	marginal
Lobelia species (L. cardinalis: cardinal flower; L. siphilitica, Great blue lobelia)	18-36"	red, blue	July, August	marginal
Monarda species (bee balm)	2-3'	red, pinks	June-July	marginal
Myosotis scorpioides (creeping forget-me-not)	3-6"	lt. blue	June-July	
Rodgersia species (rodgersia) R. aesculifolia, R. pinnata	2-3'	white, pinks	June-July	marginal

Perennials for Shady Wet Sites (Cont'd.)

2-4 hours direct sun each day (full sun in spring)

Symplocarpus foetidus (skunk cabbage)	12-18"			marginal and emergent
Thalictrum species (meadow rue)	2-6'	white, pinks	June-July	marginal
Trollius europaeus (globeflower)	18-36"	yellow	May-July	marginal

Annual Plants for Wet Sites

Plant name	height:	color:	blooms in:	notes:
Begonia semperflorens (wax begonia)	10-15"	white, red, pink	June-Sept	marginal; tender
Colocasia esculenta (elephant ear)	2-5'		marginal; tender	
Impatiens capensis (spotted touch-me-not)	2-4'	orange-yellow	July-frost	good filler over summer-dormants; will self-sow
Lantana hybrids (ham n' eggs)	18-24"	yellow, pink	June-Sept	marginal; tender
Ricinus communis (castor bean)	3-6'	reddish	July-August	marginal; tender

Shrubs for Wet Sites

Plant name	height:	color:	blooms in:	notes:
Cornus species (dogwood)	8-10"	tiny	June	marginal; colorful stems on redbud, yellowtwig; sun to half shade
Lindera benzoin (spicebush)	6-8'	yellow-green	April	red berry; sun to shade; marginal
Physocarpus opulifolius (ninebark)	3-9'	white	June	marginal
Salix species (pussy willow)	5-15'	yellow-green	April	sun; marginal; invasive
Sambucus canadensis (elderberry)	8'+	white	June	marginal
Viburnum opulus (European cranberrybush)	3-12'	white	May-June	sun to half shade; marginal

Trees for Wet Sites

Plant name	height:	color:	blooms in:	notes:
Alnus species (alders)	30'+			sun; marginal
Metasequoia glyptostroboides (dawn redwood)	60'+			4 hours sun or more; marginal
Populus species (poplars)	30-100'			sun; marginal
Salix species (willow)	30-80'			sun; marginal
Taxodium distichum (bald cypress)	60'+			sun; marginal

Perennials for Sunny Dry Sites

Plant name	width x ht.	color:	blooms in:	notes:
<i>Achillea millefolium</i> (thousand leaf yarrow)	18" x 18"	white, pink	June-July	many varieties
<i>Anaphalis</i> spp. (pearly everlasting)	2' x 1-2'	white	August	American painted lady butterfly larvae
<i>Antennaria dioica</i> (pussytoes)	1' x 8"	white, pink	June-July	American painted lady butterfly larvae
<i>Artemisia</i> spp. (wormwood, dusty miller)	to 4'	insignificant		for foliage effect allergen
<i>Asclepias tuberosa</i> (butterfly weed)	2' x 3'	orange	July	heat OK; salt OK
<i>Aster</i> spp. <i>A. ericoides</i> , <i>A. amellus</i> (Italian), <i>A. laevis</i> (smooth)	to 3'	white, pink, lilac	August	
<i>Baptisia australis</i> , other spp. (false indigo)	3-4' x 3-4'	blue seed pods	May fall-winter	also half shade; stake in shade; heat OK
<i>Buddleia davidii</i> (butterfly bush)	to 6' x 6'	violet, white, pink	August	dieback shrub, grown as perennial
<i>Chasmanthium latifolium</i> (northern sea oats)	18" x 3'	green-wheat	August-fall	also half shade and shade heat OK, salt OK
<i>Coreopsis verticillata</i> (threadleaf coreopsis esp. Moonbeam)	18-24" 18"	yellow(gold)	July- Aug	also half-shade; heat OK; salt OK
<i>Dianthus</i> species (pinks) esp. <i>Dianthus alpinus</i> , <i>D. x Alwoodii</i>	6" x 1'+	pink, white fragrant	late May- June will repeat	also half-shade; heat OK blue or blue-green evergreen
<i>Eryngium</i> spp. (eryngo, rattlesnake master <i>E. yuccifolium</i> , sea holly <i>E. planum</i>)	1' x 3'	blue, white	July	
<i>Euphorbia</i> spp. (spurge) clump-forming <i>E. myrsinites</i> , <i>E. griffithii</i> ; <i>E. cyparissas</i> a runner	8" - 3'	yellow	May	heat OK sap can irritate skin
<i>Festuca ovina</i> (blue fescue, blue sheep's fescue)	18" x 18"	wheat	June	heat OK, salt OK evergreen
<i>Gypsophila</i> spp. (baby's breath <i>G. paniculata</i> , creeping <i>G. repens</i>)	3' x 3'	white, pink	June-July	no winter wet plant with caution near any wild dry area
<i>Helictotrichon sempervirens</i> (blue oat grass)	1' x 30"	wheat	July - Sept.	
<i>Hieracium canadense</i> . (Canada hawkweed)	6" x 1'	orange yellow	June-July	
<i>Iberis sempervirens</i> (candytuft)	8" x 2'	white evergreen	May	also half-shade; heat OK
<i>Iris pallida argenteo-variega.</i> (zebra iris)	1' x 18"	violet striped leaf	mid May	heat OK
<i>Lathyrus</i> , perennial spp. (beach pea <i>L. maritimus</i> , wild sweet pea <i>L. latifolius</i>)	sprawls	pink, white mauve	July	can cling, up to 5'
<i>Lavandula angustifolia</i> (lavender)	12-18" x 2'	violet, white	June may repeat	heat OK fragrant grey evergreen
<i>Liatris aspera</i> (rough blazing star)	1' x 3-4'	purple	July	
<i>Lithospermum carolinense</i> (hairy puccoon)	1' x 1-2'	yellow-orange	late June	native to dry areas, upper MI hoary puccoon <i>L. canescens</i> smaller
<i>Nepeta</i> spp. & hybrids (catmint)	18-24" x 18-24"	violet fragrant	late May-June will repeat	heat OK
<i>Opuntia humifusa</i> (prickly pear cactus)	2'+ x 1'	yellow	July	no wet in winter barbs are deceiving - beware

Perennials for Sunny Dry Sites (Cont'd.)

Plant name	width x ht.	color:	blooms in:	notes:
Penstemon spp. (beardtongue) <i>P. pinifolius</i> , <i>P. hirsutus</i>	18" x 18"	white, red pale pink or	June-July lavender	
Perovskia species (Russian sage) <i>P. abrotanum</i> , <i>P. atriplicifolia</i>	3-4' x 2-3'	violet x 2-3'	late July-Aug	heat OK fragrant grey semi-evergreen
Santolina chamaecyparissus 1 (lavender cotton) (green and grey forms)	x 2'	cream	June fragrant evergreen	heat OK
Sedum spp. (live forever, stonecrop) esp. <i>S. spectabile</i> , <i>S. acre</i> , <i>S. kamschaticum</i> , <i>S. dasphyllum</i>	varies	white-pink -yellow	June-July or August-September	must have moisture sometime!
Sempervivum spp. (hens & chicks)	6" x 6"	insignificant	June-July	evergreen, variety of foliage colors
Silphium laciniatum (compass plant)	3' x 8'	yellow	late Jul - Aug	heat OK native sunflower relative
Sporobolus heterolepis (prairie dropseed)	1' x 3'	pinkish near white in	August - fall winter	heat OK popcorn smell; seed edible
Stachys officinalis, S. grandiflora (lambs ear and big betony)	18" + x 18"	pink/mauve	June will repeat if cut	heat OK <i>S. grandiflora</i> clump forming
Verbena canadensis (creeping vervain)	1' x 3'	purple	June will repeat	fast but short lived, even annual
Veronica incana (grey leaf veronica)	8" x 18"	blue	will repeat June	heat OK
Yucca spp. (yucca, Aaron's needle)	3' x 3'	white	June-July	evergreen

More Plant Ideas - Dry Sunny Sites

Adonis vernalis (adonis)
Allium spp. (ornamental onions) esp. *A. christophii*, *A. giganteum*, *A. sphaerocephalum*
Catananche caerulea (Cupid's dart)
Crambe cordifolia, *C. maritima* (colewort, dwarf sea colewort)
Elymus arenarius (blue lime grass)
Eremerus hybrids and spp. (foxtail lily)
Hyssopus officinalis (hyssop)
Inula ensifolia (swordleaf inula)
Iris germanica (bearded iris)
Linum perenne (blue flax)
Monarda punctata (horsemint)
Potentilla alba (dwarf white potentilla), *Potentilla nitida*
Pulsatilla vulgaris (windflower, pasqueflower)
Salvia officinalis (hardy sage)
Saponaria x oliviana (dwarf soapwort)
Stipa species (ornamental grass)
Symphytum grandiflorum (large-fl. comfrey)
Tanacetum huronense (Huron tansy)
Teucrium chamaedrys (germander)
Thymus spp. (thyme)
Verbascum spp. (mullein)
Veronica spicata (spike speedwell)

Perennials for Shady Dry Sites

Plant name	width x ht.	color:	blooms in:	notes:
<i>Actaea rubra</i> (red baneberry)	18-30" 18-30"	white fl red berry	late May-June July-August	most all of these want LOAM not sand
<i>Alchemilla mollis</i> , alpina (ladies mantle, dwarf l. m., alpine l. m.)	1' x 18" 1' x 1'	chartreuse	May & June	heat OK
<i>Anemone</i> , woodland spp. <i>A. canadensis</i> , <i>A. sylvestris</i>	18 x 18"	white	May-June	aggressive runners
<i>Aster macrophylla</i> (bigleaf aster)	1' x 2'	white	August	
<i>Campanula rotundifolia</i> (harebell)	1' x 18"	violet	June	
<i>Cerastium tomentosum</i> (snow in summer)	2' + x 8"	white	June	also in sun grey evergreen
<i>Chasmanthium latifolium</i> (northern sea oats)			see Sun plants for this and others that cross to part shade	
<i>Colchicum autumnale</i> (fall crocus, colchicum)	1' x 1'	pink, white lavender	October	foliage in spring, dies back
<i>Digitalis</i> spp. (foxglove) <i>D. ambigua</i> , <i>D. grandiflora</i>	18" x 4'	yellow, white lavender	June	short-lived perennial and biennial
<i>Epimedium</i> species (bishop's hat, mitrewort)	6-12" x 6-12"	pink, white lavender	May	watch for new, taller species semi-evergreen
<i>Euphorbia myrsinites</i> , other spp. (myrtle euphorbia)	8" x 2'	chartreuse blue evergreen	May	heat OK
<i>Gaultheria procumbens</i> (wintergreen)	12" x 6"	white	May	best in acid soil semi-evergreen
<i>Hepatica</i> species (hepatica, liverwort)	6" x 6"	pink, white violet-blue	May	evergreen
<i>Jeffersonia diphylla</i> (twinleaf)	1' x 1'	white	May	
<i>Pedicularis canadensis</i> (wood betony)	6-12" x 12-18"	mauve	May	
<i>Pulmonaria saccharata</i> (Bethlehem sage, lungwort)	12-18" x 18-24"	blue/pink	May	heat OK
<i>Smilacina racemosa</i> (starry false Solomon's seal)	1' x 2-3'	white	May	also in sun spreads as groundcover
<i>Solidago caesia</i> (bluestem goldenrod)	1' x 3-4'	yellow	August	
<i>Symphytum grandiflorum</i> (large-flowered comfrey)	18-12"	pale yellow	May	heat OK
<i>Viola pedata</i> (birdsfoot violet)	5" x 5"	violet	June	also in sun
<i>Waldestinia ternata</i> (barrenstrawberry)	4" tall	cream	May	agressivespreader; fruit (inedible) can be attractive late summer

Annuals for Dry Sites

Plant name	width x height:	color:	notes: S-sun, HS-half sun, sh-shade
Catharanthus roseus (annual periwinkle)	15" x 15"	white, pink, lilac, bicolor	S, HS
Centaurea cyanus (bachelor button)	12" x 18"	blue, pink, white	S, HS will self sow; good dried flower
Gomphrena globosa (globe amaranth)	15" x 15"	maroon, white, pink	S good dried flower
Helianthus varieties (sunflower)	2-12'	yellow, orange, white	S will self sow
Helichrysum petiolatum (licorice plant)	1-2' x 3'	insignificant	for foliage effect, cvs. such as 'Limelight'
Kochia scoparia (kochia, burning bush)	12" x 36"	flower insignif., fall color spectacular	S self sows aggressively
Mirabilis jalapa (four o'clock)	12" x 1-3'	yellow, orange, pink often on one plant	S, HS can self sow
Perilla frutescens (perilla, beefsteak plant)	12" x 18"	purple leaf; flower insignif.	S, HS self sows aggressively
Tagetes hybrids (marigold)	12" x 12-18"	yellow, orange and bicolor	S
Trachymene coerulea (blue lace flower)	12" x 18"	blue flower	S, HS
Zinnia angustifolia (narrow-leaf zinnia)	12" x 12-24"	wide range of colors	S; needs good air circulation

Trees for Dry Sites

Plant name	height x width	color interest/season:	notes: S-sun, HS-half sun, sh-shade
Acer ginnala (Amur maple)	15-18' x 15-18'	seed pods pink/Jul-Aug; fall orange-red; multi-stem	S, HS
Caragana arborescens Pendula (Siberian pea, weeping form)	12-15' x 8-12'	yellow flowers/May; bright green summer leaf	S, HS; wind OK; salt OK
Cotinus spp. (smoke tree, incl. purple <i>C. coggygia</i> European & <i>C. americana</i> American)	10-15' x 15'	white to pinkish bloom in June; purple leaf cvs., American has fall color	S, HS; can be cut back every year
Crataegus phaenopyrum (Washington hawthorn)	25' x 25'	white flower/May-June; berries into winter; orange/fall	S
Elaeagnus angustifolia (Russian olive)	20 x 25'	silvery foliage; fragrant yellow flowers in June	S, HS; heat OK; salt OK
Euonymus europaea (European spindle tree)	12-30' x 10-25'	pink fruits/Sept.; good form	S, HS, sh
Fraxinus pennsylvanica (green ash, red ash)	60 x 45'	some cvs. with good fall color gold or purple	S; heat OK; salt OK
Oxydendrum arboreum (sourwood)	25-30' x 20'	white flower/July; seed pods/Aug-Sept; red/fall	S, HS
Pinus aristata (bristlecone pine)	8-?" x 8-?"	irregular shape; dark green	S; heat OK
Prunus cerasifera Newport (Newport purple plum)	15-20' x 15-20'	white-pink flower/May; purple leaf	S
Quercus ellipsoidalis (northern pin oak)	40 x 60'	fall color often very good red	S; requires acidic soil susceptible to oak wilt

Shrubs & Vines for Dry Sites

Plant name	height x width	color interest/season:	notes: S-sun, HS-half sun, sh-shade
Berberis thunbergii forms (dwarf barberry Crimson Pygmy)	18-24" x30-36"	red leaf; dense form leaf	S, HS; heat OK; salt OK
(dwarf barberry Aurea or Bonanza Gold)	36-48" x36-48"	gold leaf; dense form	S, HS; heat OK; salt OK
Campsis radicans#*@ (trumpet vine)	30-40' fast	orange flower/Jun-Jul produces suckers,	S, HS, sh can be rampant!
Caragana spp. (peashrub, incl. Siberian weeping pea)	to 18'	yellow, May-June fine texture bright green foliage,	S, HS; heat OK; salt OK fast growth
Caryopteris x clandonensis (blue beard, blue mist spirea)	3-5' x 3-5'	blue, August S, HS twigs & grey foliage fragrant	dieback shrub often grown as perennial
Ceanothus americanus (New Jersey tea)	3' x 3'	light green leaves, dense habit flower insignif.	S, HS leaves for tea during colonial embargo
Chaenomeles x superba (hybrid of Japanese dwarf quince)	3-4' x4-6'	red-orange or red flower/May	S, HS; D
Elaeagnus umbellata (Autumn olive)	9' x 9'	silvery foliage; fragrant yellow flowers in June; berries in fall	S, HS; heat OK; salt OK use with caution near wild areas
Juniperus spp. ex: J. squamata 'Blue Star' (Blue Star juniper)	3 x 3'	silver blue foliage; dense; slow	S; heat OK
Maackia amurensis (Amur maackia)	30 x 40' x5-8'	white, June-July flowers bronze-metallic bark	S; wind OK
Mahonia aqu. compactum (dwarf Oregon grapeholly)	3-5' x5-8'	yellow flower/May; blue berry/Aug-Sep; maroon/winter	HS, sh, S; no wind if in sun
Myrica pennsylvanica (bayberry)	5-8' suckering	insignificant flower fragrant foliage semi-evergreen	S, HS; salt OK, heat OK need male and female for fruit (birds)
Polygonum aubertii# (silver lace vine, silver fleece)	25-35' fast	white flower/Aug; white seed/fall; produces suckers,	S, HS, sh; no wind can be rampant!
Potentilla fruticosa (shrubby potentilla, cinquefoil)	2-5' x3-6'	yellow flower/Jun-Sep; can be cut to ground each spring	S, HS; heat OK
Prunus x cistena@ (purple leaf sand cherry)	5-7' x4-6'	white-pink flower/May; purple leaf	S, HS; heat OK
Pyracantha x coccinea (firethorn)	6-10' x6-10'	white flower/June; orange berry/fall-winter; evergreen	S, HS; heat OK
Rhus spp. @ (sumac) staghorn s. <i>R. typhina</i> 12'; fragrant s. <i>R. aromatica</i> 4', shining s. <i>R. copallina</i> 9')	4-12', suckering	fall color, winter seedheads	S, heat OK, salt OK
Elaeagnus umbellata (Autumn olive)	9' x 9'	silvery foliage; fragrant yellow flowers in June; berries in fall	S, HS; heat OK; salt OK use with caution near wild areas
Sheperdia argentea (buffaloberry)	6'-15' x6'-15'	silvery foliage, flower insignif. berries for birds	S; heat OK
Rosa species and varieties (shrub rose climbers, ramblers, miniatures) to 20'	varies	flower/summer, some repeat; some fragrant	S; heat OK; some salt-tolerant (ex.: <i>R. rugosa</i> , <i>R. Wichuraiana</i>)
Tamarix ramosissima (tamarisk)	15 x 10'	silvery foliage; purple plumes in August; cvs. for deeper flower color	S; heat OK; salt OK
Viburnum acerifolium@ (maple-leaf viburnum)	4-6' x3-4'	white flower/May; black berry/fall; multi-color foliage/fall	HS, sh; heat OK

- vine needs support: holds by twining or with tendrils * vine is self-clinging, given time @ can be trained as tree

Trees, shrubs, perennials and annuals for windy sites

* Indicates only moderate wind tolerance

1. Trees for windy sites:

Austrian pine (*Pinus nigra*)
Hawthorn (*Crataegus spp.*)
Honey locust (*Gleditsia triacanthos*)
Running western serviceberry (*Amelanchier alnifolia*)
Russian olive (*Elaeagnus angustifolia*)

2. Shrubs for windy sites:

* Arrowwood (*Viburnum dentatum*)
Barberry (*Berberis thunbergii*)
Bayberry (*Myrica pennsylvanica*)
Beauty bush (*Kolkwitzia amabilis*)
Blue mist spirea (*Caryopteris x clandonensis*)
Broom, & Scotch broom (*Genista spp.* & *Cytisus scoparius*)
Butterfly bush (*Buddleia davidii*)
Cherry, Nanking (*Prunus tomentosa*)
Cherry, sand (*Prunus cerasifera*, *P. serotina*)
Chinese lilac (*Syringa x chinensis*)
*Common lilac (*Syringa vulgaris*)
Cotoneaster, especially "Peking" (*Cotoneaster racemiflorus*)
Juniper spp.
Ninebark (*Physocarpus opulifolius*)
Peashrub (*Caragana spp.*)
Persian lilac (*Syringa persica*)
Prinsepia (*Prinsepia sinensiss*)
Privet (*Ligustrum spp.*)
Saltspray rose (*Rosa rugosa*)
Sea buckthorn (*Hippophae rhamnoides*)

3. Perennials for windy sites:

Biennial blackeye Susan (*Rudbeckia hirta*)
Bluestar (*Amsonia spp.*)
Blue flax (*Linum perenne*)
Blue lyme grass (*Elymus or Lymus arenarius*)
Catmint (*Nepeta spp.*)
Chives (*Allium schoenoprasum*)
Cotton lavender (*Santolina spp.*)
Dune grass (*Ammophila breviligulata*)
Feverfew (*Chrysanthemum parthenium*)
Fountain grass (*Pennisetum spp.*)
Hawthorn (*Crataegus spp.*)
Beauty bush (*Kolkwitzia amabilis*)
Gaura (*Gaura Lindheimeri*)
German statice (*Limonium tataricum*)

Trees, shrubs, perennials, annuals for windy sites (Cont'd.)

(Perennials for windy sites, Cont'd.)

Globe thistle (*Echinops exaltatus*)
Golden marguerite (*Anthemis tinctoria*)
Hoary vervain (*Verbena hastata*)
Lambs' ear (*Stachys lanata*)
Lavender (*Lavandula angustifolia*)
Northern sea oats (*Chasmanthium latifolium*)
Poppy (*Papaver spp.*)Rue (*Ruta graveolens*)
Russian sage (*Perovskia spp.*)
Sage (*Salvia officinalis*)
Seaside goldenrod (*Solidago sempervirens*)
Tansy (*Tanacetum spp.*)
Yucca (*Yucca spp.*)

4. Annuals for windy sites (see "Salt" list)

Plants for sites with compacted soils

1. Trees tolerant of compacted soil:

Balsam fir (*Abies balsamea*)
Birch, river and gray (*Betula nigra*, *B. populifolia*)
Catalpa (*Catalpa speciosa*)
Cottonwood (*Populus deltoides*)
Ginkgo (*Ginkgo biloba*)
Goldenchain tree (*Laburnum x watererii*)
Hackberry (*Celtis occidentalis*)
Hardy rubber tree (*Eucommia ulmoides*)
Honeylocust (*Gleditsia triacanthos*)
Hophornbeam (*Ostrya virginiana*) (no salt)
Linden (*Tilia* spp.)
Maples: boxelder, Norway, red, silver (*Acer negundo*,
A. platanoides, *A. rubrum*, *A. saccharinum*)
Oak, swamp white (*Quercus bicolor*)
Spruce, black (*Picea mariana*)
Turkish filbert (*Corylus colurna*)
Zelkova (*Zelkova serrata*)

2. Shrubs tolerant of compacted soil:

Bayberry (*Myrica pensylvanica*)
Bush honeysuckle (*Diervilla lonicera*)
Cranberrybush viburnum (*Viburnum trilobum*)
Deutzia (*Deutzia* spp.)
Dogwood, silky and redbud (*Cornus amomum*, *C. stolonifera*)
Elderberry (*Sambucus canadensis*)
Ninebark (*Physocarpus opulifolius*)
Potentilla (*Potentilla fruticosa*)
Sandcherry (*Prunus x cistena*)
St. Johnswort (*Hypericum* spp.)
Snowberry (*Symphoricarpos orbiculatus*)
Spirea (*Spiraea* spp.)
Sweetshrub (*Calycanthus floridus*)
Virginia sweetspire (*Itea virginica*)
Witchhazel, spring (*Hamamelis vernalis*)

3. Perennials tolerant of compacted soil:

Aster (*Aster* spp. esp. *A. novae-angliae*)
Helen's flower (*Helenium autumnale*)
Yarrow (*Achillea* spp.)

4. Annuals tolerant of compacted soil:

Sunflower (*Helianthus annua*)

Plants for extreme temperature changes

1. Trees tolerant of extreme temperatures changes:

American hornbeam/blue beech (*Carpinus caroliniana*)
Birch: sweet/cherry, paper (*Betula lenta*, *B. papyrifera*)
Crabapples, prairie crabapple (*Malus* varieties, *M. ioensis*)
Eastern redcedar/juniper (*Juniperus virginiana*)
Hackberry (*Celtis occidentalis*)
Hawthorn, cockspur (*Crataegus crus-galli*)
Littleleaf linden (*Tilia cordata*)
Maples: Amur, boxelder, red (*Acer ginnala*, *A. negundo*, *A. rubrum*)
Mountain ash (*Sorbus aucuparia*)
Mulberry (*Morus alba*)
Pine, red (*Pinus resinosa*)
Poplar hybrid (*Populus x canadensis* 'Robusta')
Tree lilac (*Syringa reticulata*)

2. Shrubs tolerant of extreme temperatures changes:

Alpine currant (*Ribes alpinum*)
Autumn olive (*Elaeagnus commutata*)
Barberry (*Berberis thunbergii*)
Bastard indigo (*Amorpha fruticosa*)
Bearberry (*Arcostaphylos uva-ursi*)
Beautybush (*Kolkwitzia amabilis*)
Dogwood, redbud (*Cornus alba*)
Kerria (*Kerria japonica*)
Mockorange (*Philadelphus* spp.)
Ninebark (*Physocarpus opulifolius*)
Peashrub (*Caragana arborescens*)
Pine: mugo, (white) (*Pinus mugo*, *P. strobus*)
Potentilla (*Potentilla fruticosa*)
Pussywillow (*Salix discolor*)
Rug juniper (*Juniperus horizontalis*)
Sandcherry (*Prunus x cistena*)
Snowberry (*Symphoricarpos orbiculatus*)
Viburnums (*V. trilobum*, *V. opulus*, *V. lentago*)

3. Perennials tolerant of extreme temperatures changes:

Allium (<i>Allium</i> spp.)	Prickly pear (<i>Opuntia humifusa</i>)
Border jewel (<i>Polygonum affine</i>)	Primrose (<i>Primula</i> spp.)
Foamflower (<i>Tiarella cordifolia</i>)	Yarrow (<i>Achillea</i> spp.)
Globethistle (<i>Echinops ritro</i>)	Yucca (<i>Yucca</i> spp.)

4. Annuals tolerant of extreme temperatures changes:

Extreme seasonal changes shouldn't affect annuals, which are planted *after* the weather settles

Trees, shrubs, perennials and annuals for salty sites

most listed primarily for windblown salt

* indicates only moderate tolerance)

1. Trees for salty sites:

Ash, green (*Fraxinus pennsylvanica*)
Austrian pine (*Pinus nigra*)
Black locust (*Robinia Pseudoacacia*)
Cherry (*Prunus spp.*)
*Colorado blue spruce (*Picea pungens*)
Corkscrew willow (*Salix matsudana* 'Tortuosa')
Honey locust (*Gleditsia triacanthos*)
Horsechestnut (*Aesculus hippocastanum*)
Kentucky coffeetree (*Gymnocladus dioicus*)
Linden (*Tilia cordata*, *T. americana*)
Mulberry (*Morus spp.*)
*Norway maple (*Acer platanoides*)
Poplar, cottonwood, aspen (*Populus spp.*)
Redosier dogwood (*Cornus sericea*, *C. stolonifera*)
Russian olive (*Elaeagnus angustifolia*)
Shining sumac (*Rhus coppalina*)
*Staghorn sumac (*Rhus typhina*)
*Sycamore maple (*Acer pseudoplatanus*)
Tree of heaven (*Ailanthus altissima*)
*White spruce (*Picea glauca*)

2. Shrubs for salty sites:

Autumn olive (*Elaeagnus umbellata*)
Bayberry (*Myrica pennsylvanica*)
Buffaloberry (*Sheperdia argentea*)
Cherry, beach (*Prunus maritima*)
European fly honeysuckle (*Lonicera xylosteum*)
Groundsel tree (*Baccharis halimifolia*)
Juniper spp. esp . *J. conferta*, *J. virginiana*, *J horizontalis*
Saltspray rose (*Rosa rugosa*)
Summersweet (*Clethra alnifolia*)
Tamarix, salt cedar (*Tamarisk spp.*)
Vanhoutte spirea (*Spiraea x vanhouttei*)

3. Perennials for salty sites:

Artemisia
Bearberry (*Arcostaphylus uva-ursi*)
Blue lyme grass (*Elymus or Lymus arenarius*)
Daylily (*Hemerocallis spp.*)
Dune grass (*Ammophila breviligulata*)
Giant reed (*Phragmites australis*)
Maiden grass (*Miscanthus sinensis*)
Northern sea oats (*Chasmanthium latifolium*)

Red hot poker (*Kniphofia* spp.)
Sea holly (*Eryngium* spp.)
Sea lavender (*Limonium latifolium*)
Seaside goldenrod (*Solidago sempervirens*)
Sedum 'Autumn Joy'
St. Johnswort, creeping (*Hypericum calycinum*)
Sweet pea (*Lathyrus* spp.)
Thinleaf sunflower, swamp s. (*Helianthus angustifolius*)
Thrift, sea pink (*Armeria maritima*)
Virginia creeper vine (*Parthenocissus quinquefolia*)
Woolly yarrow (*Achillea tomentosa*)

4. Turfgrasses for salty sites:

Buffalo grass (*Buchloe dactyloides*)
'Dawson' red fescue
'Galway' fescue
'Rugby' Kentucky bluegrass
Western bunchgrass (*Puccinellia distans*)

5. Annuals for salty sites

Arctotis
Bachelor button (*Centaurea cyanus*)
California poppy (*Eschscholzia californica*)
Celosia
Dianthus, annual pinks
Dill (*Anthem graveolens*)
Dusty miller (*Senecio cineraria*)
Love in a mist (*Nigella damascena*)
Marigold
Sea poppy (*Glaucium corniculatum*)
Statice (*Limonium sinuatum*)
Sweet alyssum (*Lobularia maritima*)