

Western Coordinating Committee Petition

NUMBER: WCC-058

TITLE: Production, Transition Handling, and Reestablishment of Perennial Nursery Stock

DURATION: October 1, 1999 to September 30, 2002

DESCRIPTION AND JUSTIFICATION: Plant production, transition handling, and reestablishment of nursery stock continues to be challenging in light of new plant introductions and growing techniques. It is essential to understand past and current problems in order to design an integrated research approach to address issues facing perennial plant producers.

Commercial production is concentrated in regions with climate favoring rapid and cost effective plant growth. Visiting these major production regions affords the opportunity for WCC-058 participants to interact with growers and handlers in identifying production handling and reestablishment issues. Research addressing proper acclimation and handling of perennial plants before shipment to climatically diverse regions is critical to their quality, survival, and ability to re-establish.

OBJECTIVES:

- 1) To provide a forum where integrated research and education approaches are designed regarding problems facing plant nurseries involved in plant production, transition handling and reestablishment of perennial nursery stock.
- 2) To share new research information about transition handling and reestablishment of perennial nursery stock and identify high priority areas and foster interdisciplinary research and education projects among WCC-058 scientists.
- 3) Prepare reviews or summaries of topics relevant to the plant production, transition handling, and reestablishment of nursery stock with the general research community and other interested persons by publishing information in journals and on the website of the WCC-058.

EXPECTED OUTCOMES:

- 1) **Enhance research efforts:** Comprehension of major concerns facing nursery growers who produce perennial nursery stock by WCC-058 scientists allow for emphasis on high-priority research needs. Cooperative projects continue to evolve through interaction of participants across major production areas in the Western States as well as outside the Western Region.

- 2) Multidisciplinary involvement: Multidisciplinary and interregional participants in the WCC-058 have included scientists from 18 states. This diverse background and experience in all aspects of production, transition handling and reestablishment of perennial nursery stock results in dynamic discussion and enlightened research planning and interdisciplinary projects. The participants have expertise in areas such as plant growth and development, post-harvest physiology, and plant stress physiology. The meetings have also included disciplines of biosystems engineering, plant pathology, entomology, and economics. Efforts are made to include scientists and graduate students in the committee meetings to extend the scope of information exchange and potential for cooperative research. Thus, the coordinating committee has provided an effective vehicle for communication and sharing between scientists, educators, and industry professionals which otherwise would not exist.
- 3) Improved nursery stock production: Recognition of emerging problems involving the perennial nursery stock industry and the exchange of research information amongst scientists will result in practices reducing post-production losses, improving efficiency and producing high quality plant material while sustaining environmental quality. Consumers are the ultimate benefactors of the interdisciplinary and interregional approach through greater selection of new material and improved performance, survival, and quality of landscape plants.
- 4) Standardization: Research-based development of standards for production-transition-establishment of perennial nursery stock has resulted from interregional cooperative research. These standards continue to provide a data base for improved technology transfer and problem solving. Interregional cooperation ensures that information is readily transformed into practice as it develops.
- 5) Improved education: Opportunities for students and university personnel interested in nursery production to interact with WCC-058 members at the annual meetings expand educational opportunities. Tours of nursery facilities, plant collections, or landscapes enhance all participant's understanding of challenges in producing or using perennial nursery stock in different climate zones. Visuals taken at these tours are valuable teaching aids for all participants in the classroom and for training of professional growers. Comparison of teaching methods amongst participants is another valuable educational component of this group.

EDUCATIONAL PLAN:

WCC-058 is a vehicle for intraregional and interregional, multidisciplinary research approaches to identify and integrate environmentally sound production, transition, and establishment strategies for perennial landscape plans. WCC-058 is the only coordinating committee focusing on these critical issues. There are individual and

joint research efforts by WCC-058 participants dealing with the problems of the nursery and landscape industry. New applied information is disseminated in classrooms and through professional and popular/trade magazine publications. All members of the WCC-058 are involved in presentations at workshops and field days through their respective university outreach programs.

PARTICIPANTS:

	Research	Extension	Teaching
Cabrera, Raul I. Rutgers University Plant Science	25	75	0
Cameron, Arthur Michigan State University Horticulture	70	0	30
Chen, Tony H. Oregon State University Horticulture	90	0	10
Cole, Janet Oklahoma State University Horticulture	80	0	20
Dana, Michael Purdue University Horticulture	0	40	60
Graves, Bill Iowa State University Horticulture	70	0	0
Hensley, David University of Hawaii Horticulture	0	30	10
Hummel, Rita L. WSU-Puyallup Research & Extension Center	75	0	25
Johnson, Charles R. Washington State University WSU Research & Extension Unit	50	50	0
Kjelgren, Roger Utah State University Plant Science	75	0	0
Klett, James E. Colorado State University Horticulture	0	20	60
Kling, Gary J. University of Illinois	40	0	60

Horticulture			
Kuhns, Larry Pennsylvania State University Horticulture	35	0	0
Maynard, Brian University of Rhode Island Plant Sciences	28	24	0
Pemberton, Brent Texas A & M Agricultural Research & Extension Center	100	0	0
Pittenger, Dennis R. University of California Horticulture	20	80	0
Robbins, Jim University of Arkansas Coop. Ext. Service - Horticulture	25	75	0
Schuch, Ursula K. Iowa State University Horticulture	20	0	80
St. Hillaire, Rolston New Mexico State University Horticulture	54	0	55
Starbuck, Chris University of Missouri Horticulture	25	75	0
Struve, Daniel K. The Ohio State University Horticulture	60	0	40
Tripepi, Robert University of Idaho Plant Science	45	0	55

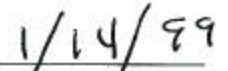
OPERATIONAL STRUCTURE:

WCC-058 officers are the secretary, vice-chair, and chair. A new secretary is elected every year and elevated to the position of chair in their third year. The secretary is responsible for recording minutes of the annual meeting and coordinating names, addresses, telephone numbers, etc. The vice-chair assists the chair in arranging the business meeting and serves in the absence of the chair. The chair of the WCC-058 conducts the business meeting, generates informational materials, participates in renewal of the petition and assists in coordinating meeting sites with a local arrangement committee.

SIGNATURES:



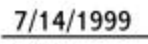
Administrative Advisor**



Date



CHAIR, REGIONAL ASSOCIATION OF DIRECTORS



Date

ATTACHMENTS:

ACCOMPLISHMENTS:

Accomplishments of the WCC-058 1996-1998

A primary benefit of the WCC-058 Coordinating Committee is the facilitation of cooperative research, extension and teaching exchange of new information. These efforts involve the utilization of greenhouse, field and laboratory facilities in the Western States as well as universities situated in the Midwest and East. Sharing knowledge of new techniques, interaction with the perennial plant industries in different locations adds to the credibility and strength of the WCC-058. The following are examples of research projects that are both in process and completed.

1. Comparing Growth of Trees field-planted After Being Held in a Missouri Gravel Bed (MGB) with Growth of Container Grown and Dormant-planted Bare Root Trees.

Jeff Illes, Bill Graves and Chris Starbuck initiated a project in 1995 to compare growth of trees field-planted after being held in a Missouri Gravel Bed (MGB) with growth of container grown and dormant-planted bare root trees. Redbud, green ash and red maple trees from cold storage at Sherman Nursery, Charles City IA were either planted directly in April, containerized or placed in a gravel bed. Container grown and MGB plants were then field planted in the same research nursery at Ames on July 15. Growth was monitored through the 1996 season. This longer plant study provided data valuable for the refinement of the Missouri Gravel Bed system for extending the planting season for bare root nursery stock.

2. Diurnal cycles of Stomatal Resistance and Canopy Temperature of Redbud and Hackberry over Asphalt and Turf

Roger Kjelgren and Janet Cole have initiated a project to evaluate diurnal cycles of stomatal resistance and canopy temperature of Redbud and Hackberry over asphalt and turf. The main objective is to evaluate differences in plant performance (canopy temperature, stomatal resistance, and plant water use) over asphalt and turf surfaces. Temperatures above the two surfaces are very different even though the rest of the environment may be similar. Plant performance in situations where trees may be placed in planters (or in the ground) in parking areas (asphalt) or in more natural environments such as in parks, yards, etc. (turf) is evaluated. The study is being conducted in Logan, Utah and in Stillwater, Oklahoma because Logan, in general, has a very low

relative humidity and Stillwater generally has a very high relative humidity during the growing season. Two sites with varying environments are used in this study to compare if the plants perform similarly.

3. Improving Postharvest Handling of Bare Root Dormant Roses

Dr. Brent Pemberton spent several days on a study tour at Michigan State University to collaborate with Dr. Art Cameron on research protocols aimed at improving the postharvest handling of bare root dormant rose plants.

4. Best Management Practices for the Harvest, Postharvest Storage, Transition Handling, and Landscape Reestablishment of Perennial Nursery Stock

A project has been initiated by the group to produce a document addressing Best management Practices for the harvest, Postharvest Storage, Transition Handling, and Landscape Reestablishment of Perennial Nursery Stock. The first step will be the writing of annotated bibliographies on subjects pertinent to the overall goals of the project.

APPENDIX

PUBLICATIONS OF WCC-58 MEMBERS 1996 - 1998

Journal Articles

- Aiello, A.S. and W.R. Graves. 1997. Container medium and nitrogen form affect production of Amur maackia. HortScience 32:1200-1203.
- Aiello, A.S. and W.R. Graves. 1998. Success varies when using subirrigation instead of mist to root softwood cuttings of woody taxa. Journal of Environmental Horticulture 16:42-47.
- Aiello, A.S. and W.R. Graves. 1996. Two leguminous tree species differ in growth and ion uptake in Hoagland solution: Phosphorus toxicity in Amur maackia. Journal of Plant Nutrition 19:1061-1073.
- Bethke, J., Redak, R.A. and U.K. Schuch. 1998. Melon aphid performance on chrysanthemum as mediated by cultivar, fertilizer, and irrigation levels. Entomol. Exp. et. Appl. (in press)
- Byrne, D. H., W. Black, Y. Ma and H. B. Pemberton. 1996. The use of amphidiploidy in the development of black spot resistant rose germplasm. Acta Horticulturae 424:269-272.
- Byrne, D. H., Yan Ma, and H. B. Pemberton. 1997. The Bayse chair in rose genetics and breeding. The Texas Horticulturist 24(4): 8,11.
- Cabrera, R.I. and D. R. Devereaux. 1999. Crape myrtle post-transplant growth as affected by nitrogen nutrition during nursery production. J. Amer. Soc. Hort. Sci. 124(1): xx-xx (In Press).
- Cabrera, R.I. 1999. Propiedades, uso y manejo de sustratos de cultivo para la producción de plantas en maceta Horticultura. (*Properties, use and management of growing media for container plant production*). Revista Chapingo - Serie 5(1): xx-xx (In press).
- Cabrera, R.I. 1998. Monitoring chemical properties of container growing media with small soil solution samplers. Scientia Hortic. 75: 113-119.
- Cabrera, R.I. and D.R. Devereaux. 1998. Effects of nitrogen supply on growth and plant nutrient status of containerized crape myrtle. J. Envir. Hort. 16(2): 98-104.
- Cabrera, R.I. 1997. Eficiencia en el uso del agua en rosas desarrolladas bajo distintos regimenes de fertilización nitrogenada y riego. (*Water use efficiency in roses grown at different nitrogen fertilization and irrigation regimes*). Revista Chapingo - Serie Horticultura. 3(1): 5-12.
- Cabrera, R.I. 1997. Comparative evaluation of nitrogen release patterns from controlled-release fertilizers by nitrogen leaching analysis. HortScience 32: 669-673.
- Cabrera, R.I., R.Y. Evans, and J.L. Paul. 1996. Nitrate and ammonium uptake by greenhouse roses. Acta Hortic. 424: 53-57
- Cabrera, R.I., R.Y. Evans, and J.L. Paul. 1996. Enhancement of short-term nitrogen uptake by greenhouse roses under intermittent N-deprivation. Plant and Soil. 179: 73-79.

- Cole, J., R. Kjelgren, and D. Hensley. 1998 Fabric containers as an alternative nursery crop production system. *HortTechnology*. 8(2)1-5.
- Cole, J. C., R. K. Kjelgren, , and D L. Hensley. 1998. In-ground fabric containers as an alternative nursery crop production system. *HorTechnology* 8:159-163. Kjen, R. K. and L. A. Rupp. 1998. Using HortBase in education. *Hort Technology* 8:301-306.
- Cole, J.C., R. Kjelgren and D.L. Hensley. 1998. Field grow fabric containers as an alternative nursery crop production system. *HortTechnology* 8:159-163.
- Cole, J.T., J.H. Baird, N.T. Basta, R.L. Huhnke, D.E. Storm, G.V. Johnson, M.E. Payton, M.D. Smolen, D.L. Martin and J.C. Cole. 1997. Influence of buffers on pesticide and nutrient runoff from bermudagrass turf. *J. Environ. Qual.* 26:1589-1598.
- Cole, J.C. and J.M. Dole. 1997. Temperature and phosphorus source affect phosphorus retention by a pine bark medium. *HortScience* 32:236-240.
- Cole, J.C. and L. Newell. 1996. Recycled paper influences container substrate physical properties, leachate mineral content, and growth of rose-of-sharon and forsythia. *HortTechnology* 6:79-83.
- Cushman, L. L., H. B. Pemberton, J. C. Miller, and J. W. Kelly. 1998. Flower stage, cultivar, and shipping temperature and duration interactions affect pot rose performance. *HortScience* 33:736-740.
- Davies, F.T., Jr., S.E. Svenson, J.C. Cole, L. Phavaphutanon, S.A. Duray, V. Olalde-Portugal, C.E. Meier and S.H. Bo. 1996. Non-nutritional stress acclimation of mycorrhizal woody plants exposed to drought. *Tree Physiol.* 16:985-993.
- Drees, B. M., H. B. Pemberton, and C. L. Cole. 1997. Managing insects and related pests of roses. TX Ag. Ext. Serv. Bulletin B-6068. 8 pp.
- Dunn, D.E., J.C. Cole and M.W. Smith. 1996. Position of cut, bud retention and auxins influence rooting of *Pistacia chinensis*. *Scientia Hort.* 67:105-110.
- Dunn, D.E., J.C. Cole and M.W. Smith. 1996. Timing of *Pistacia chinensis* rooting using morphological markers associated with calendar date and degree days. *J. Amer. Soc. Hort. Sci.* 121:269-273.
- Foster, C.M., W.R. Graves, and H.T. Horner. 1998. ENOD2 cDNA clone from nodules of *Maackia amurensis* Rupr. & Maxim. (accession no. AF039708) (PGR 98-060). *Plant Physiology* 116:1604.
- Foster, C.M., H.T. Horner, and W.R. Graves. 1998. Isolation of a 14-3-3 brain protein homolog from nodules of *Maackia amurensis* Rupr. & Maxim. (accession no. AF039709) (PGR 98-061) *Plant Physiology* 116:1604.
- Foster, C.M., H.T. Horner, and W.R. Graves. 1998. Nodulation response of woody Papilionoid species after inoculation with rhizobia and soils >from Hawaii, Asia, and North America. *Plant and Soil*: in press.
- Geater, C.A., G.R. Nonnecke, W.R. Graves, A.S. Aiello, and C.A. Dilley. 1997. High root zone temperatures inhibit growth and development of *Fragaria* species. *Fruit Varieties Journal* 51:94-101.
- Graves, W.R. and H. Zhang. 1996. Relative water content and rooting of subirrigated stem cuttings in four environments without mist. *HortScience* 31:866-868.

- Graves, W.R. and A.S. Aiello. 1997. Root-zone temperatures above 29 °C reduce transpiration, water potential, and growth of silver maple indigenous to Minnesota and Mississippi. *Journal of the American Society for Horticultural Science* 122:195-199.
- Haver, D. L. and U. K. Schuch. 1996. Production and postproduction performance of two New Guinea impatiens cultivars grown with controlled-release fertilizer and no leaching. *Journal of the American Society for Horticultural Science* 121 820-825.
- Hensley, D. and J. Yogi. 1996. Growth regulation of some tropical species. *Journal of Arboriculture*. 22(5):244-247.
- Hensley, D. 1996. The landscape industry council of Hawaii-An experiment in cooperation. *HortScience* 31(4):594.
- Kjelgren R. and T. Montague. 1998. Urban Tree Transpiration Over Turf and Asphalt Surfaces. *Atmospheric Environment* 32:35-41
- Kjelgren, R. and L. Rupp. 1997. Treeshelters improve seedling establishment under herbaceous competition. *Int. Soc. Arbor. J.* 23(4):131-135
- Kjelgren, R. 1996. Irrigation timing of tree landscape shrub species based on foliage temperature. *Arboricultural J.* 20:47-57
- Kjelgren, R., and T. Montague. 1996. Isolated tree water use over various urban surfaces. pp. 250-256 In: *Evapotranspiration and Irrigation Scheduling, Proceedings of the International Conference.* San Antonio TX, Nov 3-6
- Kjelgren, R., and L. Rupp. 1997. Establishment in Treeshelters I: Shelters Reduce Growth, Water Use, and Hardiness, but not Drought Avoidance. *HortScience* Vol. 32(7):1281-1283
- Kjelgren, R., T. Montague, and L. Rupp. 1997. Establishment in Treeshelters II: Effect if shelter color on gas exchange and hardiness. *HortScience* Vol. 32(7):1284-1287
- Klein, G. J. and U. K. Schuch. 1996. Trade flows and marketing practices within the California nursery industry - survey results from 1988 and 1993. *J. Env. Hort.* 14: 129-136.
- Klock, K.A., H.G. Taber, and W.R. Graves. 1997. Root respiration and phosphorus nutrition of tomato plants grown at 36 °C root-zone temperature. *Journal of the American Society for Horticultural Science* 122:175-178.
- Klock, K.A., W.R. Graves, and H.G. Taber. 1996. Growth and phosphorus, zinc, and manganese content of tomato, muskmelon, and honey locust at high root-zone temperatures. *Journal of Plant Nutrition* 19:795-806.
- Kobayashi, K., M. Young, D. Hensley, H. Bittenbender and J. Yogi. 1996. Farmer's bookshelf: Hypermedia information system to recommend trees for landscaping. *HortScience* 31(4):652.
- Kyalo, T. M., H. B. Pemberton, and J. M. Zajicek. 1996. Seasonal growing environment affects quality characteristics and postproduction longevity of potted miniature roses. *HortScience* 31:120 122.
- Kyalo, T. M., H. B. Pemberton and J. M. Zajicek. 1996. Seasonal differences in post-production longevity of potted miniature roses. *Acta Horticulturae* 424:163-167.
- Lange, D.L. and A.C. Cameron. 1997. Pre- and postharvest temperature conditioning of greenhouse-grown sweet basil. *HortScience*. 32:114-116.

- Lange, D.L. and A.C. Cameron. 1998. Controlled-atmosphere storage of sweet basil. *HortScience*. 33:741-743.
- McGillivray, L., S. Wiest, and D. Hensley. 1996. A survey of line clearance operations in Kansas. *Journal of Arboriculture* 22(6):281-282.
- Maynard, B.K. and N.L. Bassuk. 1996. Effects of Stock Plant Etiolation, Shading, Banding, and Shoot Development on Histology and Cuttings Propagation of *Carpinus betulus* L. fastigiata. *J. Amer. Soc. Hort. Sci.* 121(5): 853-860.
- Maynard, B.K., W. A. Johnson, Thomas Holt and Dixon Hoogendoorn. 1996. Stock Plant Shading to Increase Rooting of Paperbark Maple Cuttings. *Proc. Int. Plant Prop. Soc.* 46:611 613.
- Maynard, B.K. 1996. A Sustainable Landscape for Learning. *Landscape Plant News*, 7(2):11-12.
- Maynard, B.K. 1996. A Tough Year for Pines. *Yankee Nursery Quarterly* 6(1):13-15.
- Maynard, B. and W.A. Johnson. 1997. Controlling rooting-out of B&B stock during storage. *J. Environmental Hort.* 15(2): 111-114.
- Meeks, M., H. B. Pemberton, L. Marsh, and G. V. McDonald. 1997. The effect of UV-B lamp light on the growth of three bedding plant species. *HortScience* 32:589. Abstr.
- Montague, T., R. Kjelgren, and L. Rupp. 1998. Surface energy balance affects gas exchange of three shrub species. *J. Arboricult.* 24:254-262.
- Morvant, J.K., J.M. Dole and J.C. Cole. 1998. Irrigation frequency and system effect poinsettia growth, water use, and run-off. *HortScience* 33:42-46.
- Murdoch, C., R. Nishimoto, and D. Hensley. 1997 Henry's crabgrass control and phototoxicity to bermudagrass turf of four organic arsenical herbicides. *Journal of Turfgrass Management*. 2(2)37-41.
- Ngoya, C., D. Hensley, and C. Murdoch. 1997. Evaluation of recycled glass and compost as a turfgrass media. *Journal of Turfgrass Management*. 2(1):1-14.
- Pemberton, H. B., H. F. Wilkins, and J. S. Hodges. 1998. Growth relationships of individual flowers during late stages of floral development of *Rhododendron* L. 'Prize' and 'Gloria'. *Can. J. Bot.* (In press).
- Pemberton, H. B., J. W. Kelly, and J. Ferare. 1997. Pot rose production. A. Armitage ed. Timber Press Growers Handbook Series Volume 7. Timber Press. Portland, OR. 115 pages.
- Richardson, M., R.I. Cabrera, J.A. Murphy and D. Zaurov. 1998. Nitrogen-form and endophyte-infection effects on growth, nitrogen uptake and alkaloid content of Chewings fescue turfgrass. *J. Plant Nutr.* (Accepted).
- Rosetta, R., S.E. Svenson, S.E., N.C. Bell. 1998. Evaluation of three soil-applied insecticides for root weevil control in container-grown nursery crops. *Proceedings of the Southern Nursery Association Research Conference* 43:(in press).
- Rosetta, R.L. S.E. Svenson and N.C. Bell. 1998. Evaluation of three soil applied insecticides for root weevil control. *Proceedings of the Western Conference on Pest of Ornamentals and Turf* (abstr.).

- Runkle, E.S., R.D. Heins, A.C. Cameron, and William H. Carlson. 1998. Flowering of herbaceous perennials under various night interruption and cyclic lighting treatments. *HortScience*. 33:672-677.
- Runkle, E.S., R.D. Heins, A.C. Cameron and W.H. Carlson. 1998. Flowering of cold-treated field-grown *Astilbe*. *HortTechnology*. 8:207-209.
- Runkle, E.S., R.D. Heins, A.C. Cameron, and W.H. Carlson. 1998. Flowering of *Leucanthemum* \times *superbum* 'Snowcap' in response to photoperiod and cold treatment. *HortScience*. 33:1003-6.
- Runkle, E.S., R.D. Heins, A.C. Cameron, and W.H. Carlson. 1998. Photoperiod and cold treatment regulate flowering of *Rudbeckia fulgida* 'Goldsturm' *HortScience* (In press.).
- Rupp, L., and R. Kjelgren. 1997. Effect of annual shearing on growth of five high desert shrubs. *J. Env. Hort.* 15(3):123-125
- Schuch, U. K. and D. R. Pittenger. 1996. Root and shoot growth of eucalyptus in response to container configuration and CuCO_3 . *HortScience* 31: 165.
- Schuch, U. K. and D. W. Burger. 1997. Water use and crop coefficients of woody ornamentals in containers. *J. Amer. Soc. Hort. Sci.* 122:727-734.
- Schuch, U. K., R. A. Redak, and J. Bethke. 1998. Cultivar, fertilizer, and irrigation affect vegetative growth and susceptibility of chrysanthemum to western flower thrips. *J. Amer. Soc. Hort. Sci.* 123:727-733.
- Svenson, S.E., B. Smith and B. Briggs. 1997. Controlling liverworts and moss in nursery production. *Proceedings of the International Plant Propagator's Society* 47:414-422.
- Svenson, S.E. 1997. Suppression of liverwort growth in containers by cinnamic aldehyde. *Proceedings of the Southern Nursery Association Research Conference* 42:494-496.
- Svenson, S.E., D. Adams and R.L. Ticknor. 1997. Controlling root and weed growth in a nursery crop sandbed subirrigation system. *Proceedings of the Southern Nursery Association Research Conference* 42:497-500.
- Svenson, S.E. 1998. Suppression of liverwort growth in containers using irrigation, mulches, fertilizers and herbicides. *Proceedings of the Southern Nursery Association Research Conference* 43:(in press.)
- Starbuck, C. J. 1996. First-rate benefits from secondhand materials. *American Nurseryman*. 184:39-43.
- Talasila, P.C. and A.C. Cameron. 1997. Prediction equations for gases in flexible modified-atmosphere packages of 62:926-930. respiring produce are different than those for rigid packages. *J. Food Science*.
- Talasila, P.C. and A.C. Cameron. 1997. Free-volume changes in flexible, hermetic packages containing respiring produce. *J. Food Science*. 62:659-664.
- Whitman, C.M., R.D. Heins, A.C. Cameron, and W.H. Carlson. 1998. Lamp type and irradiance level for daylength extensions influence flowering of *Campanula carpatica* 'Blue Clips', *Coreopsis grandiflora* 'Early Sunrise', and *Coreopsis verticillata* 'Moonbeam'. *J. Amer. Soc. Hort. Sci.* 123:802-807.

- Whitman, Catherine M., Royal D. Heins, Arthur C. Cameron, and William H. Carlson. 1997. Cold treatment and forcing temperature influence flowering of *Campanula carpatica* 'Blue Clips'. HortScience 32(5):861-865.
- Whitman, Catherine M., Royal D. Heins, Arthur C. Cameron, and William H. Carlson. 1996. Cold treatment, photoperiod, and forcing temperature influence flowering of *Lavandula angustifolia*. HortScience 31(7):1150-1153.
- Yuan, Mei, William H. Carlson, Royal D. Heins, and Arthur C. Cameron. 1998. Determining the duration of the juvenile phase of *Coreopsis grandiflora* (Hogg ex Sweet.), *Gaillardia xgrandiflora* (Van Houtte), *Heuchera sanguinea* (Engelm.), and *Rudbeckia fulgida* (Ait.). Scientia Horticulturae. 72:135-150.
- Yuan, Mei, William H. Carlson, Royal D. Heins, and Arthur C. Cameron. 1998. Effect of forcing temperature on time to flower of *Coreopsis grandiflora*, *Gaillardia xgrandiflora*, *Leucanthemum xsuperbum*, and *Rudbeckia fulgida*. HortScience. 33:663-667.
- Zhang, H., W.R. Graves, and A.M. Townsend. 1997. Water loss and survival of stem cuttings of two maple cultivars held in subirrigated rooting medium at 24 to 33 °C. HortScience 32:129-131.
- Zwack, J.A., W.R. Graves, and A.M. Townsend. 1998. Leaf water relations and plant development of three Freeman maple cultivars subjected to drought. Journal of the American Society for Horticultural Science 123:371-375.

Non-refereed Journals and Trade Articles, Abstracts and Other

- Adams, D.G., S.E. Svenson and R.L. Ticknor. 1997. Making your bed. *American Nurseryman* 185(2):60-67.
- Bezona, N., D. Hensley, J. Yogi, J. Tavares, F. Rauch, R. Iwata, M. Kellison, and M. Wong. 1996. *Salt and wind tolerance of landscape plants in Hawaii*. CTAHR Instant Information Sheet No. 19.
- Cabrera, R.I. 1998. Sustratos para contenedor: propiedades químicas (*Growing media: chemical properties*). Viveros (In Press). (Argentina).
- Cabrera, R.I. 1998. Sustratos para contenedor: propiedades físicas (*Growing media: physical properties*). Viveros 6(41): 26-31 (Argentina).
- Cabrera, R. I. 1998. Using slow- and controlled-release fertilizers. *The Chrysanthemum* 54(2): 74-78, (Summer Issue).
- Cabrera, R.I. 1997. Water use by roses. *Roses Inc. Bulletin*. August Issue. pp. 37-42.
- Cabrera, R. I. 1997. Let the nutrients flow ... slowly. *American Nurseryman* 185(5): 32-37, (March 1 Issue).
- Cameron, Art, Royal Heins and Will Carlson. 1996. Forcing Perennials 101. *Greenhouse Grower*. 14(3):19-20.
- Cameron, Art, Royal Heins and Will Carlson. 1996. Forcing Perennials 102. *Greenhouse Grower*. 14(4):19-20.
- Cameron, Art, Royal Heins and Will Carlson. 1996. Forcing herbaceous perennials. *PPGA News* Vol. XXVII, No. 7, July.
- Cameron, Art, Mei Yuan, Royal Heins, Will Carlson. 1996. Juvenility: your perennial crop's age affects flowering. *GrowerTalks* 60(8):30-34.
- Deputy, J., D. Hensley, and J. Tavares. 1998 *St. Augustinegrass*. CTAHR CES TM-3.
- Finical, Leslie, Art Cameron, Royal Heins, Will Carlson and Kevin Kern. 1998. Forcing perennials - crop by crop - *Gaura lindheimeri* 'Whirling Butterflies'. *Greenhouse Grower*. 16(7):121-124.
- Finical, Leslie, Alison Frane, Art Cameron, Royal Heins, and Will Carlson. 1998. Forcing perennials - crop by crop - *Campanula* 'Birch Hybrid'. *Greenhouse Grower*. 16(8):121-124.
- Finical, Leslie, Alison Frane, Paul Koreman, Art Cameron, Royal Heins, and Will Carlson. 1998. Forcing perennials - crop by crop - *Geranium dalmaticum*. *Greenhouse Grower*. 16(6):69-72.
- Finical, Leslie, Erik Runkle, Art Cameron, Royal Heins, and Will Carlson. 1998. Forcing perennials - crop by crop - *Echinacea purpurea* 'Bravado'. *Greenhouse Grower*. 16(9):49-52.
- Frane, Alison., Will Carlson, Art Cameron, and Royal Heins. 1998. Forcing perennials - crop by crop - *Delphinium grandiflorum* 'Blue Mirror'. *Greenhouse Grower*. 16(3):37-40.
- Frane, Alison., Erik Runkle, Royal Heins, Will Carlson and Art Cameron. 1998. Forcing perennials - crop by crop - *Lobelia xspeciosa* 'Compliment Scarlet'. *Greenhouse Grower*. 16(4):79-82.

- Hamaker, Cheryl K., Royal D. Heins, Art Cameron, and Will Carlson. 1996. Forcing perennials - crop by crop - *Coreopsis verticillata*. *Greenhouse Grower*. 14(8):43-46.
- Hamaker, Cheryl K., Beth E. Engle, Royal D. Heins, William H. Carlson, and Art Cameron. 1996. Using growth regulators to control height of herbaceous perennials. *GrowerTalks* 60(6):46-53.
- Hamaker, Cheryl K., Royal Heins, Art Cameron, Will Carlson. 1996. Perennials: best long-day treatments for your varieties. *GrowerTalks* 60(8):36-42.
- Hamaker, Cheryl, Royal Heins, Art Cameron, and Will Carlson. 1996. Forcing perennials - crop by crop - *Physostegia virginiana*. *Greenhouse Grower*. 14(12):43-46.
- Heins, R.D., A.C. Cameron, W.H. Carlson, E.Runkle, C. Whitman, M.Yuan, C. Hamaker, B. Engle, and P. Koreman. 1997. Controlled flowering of herbaceous perennial plants, p. 15-31. In: E. Goto et al. (eds.). *Plant production in closed ecosystems*. Kluwer Academic Publishers, The Netherlands.
- Hensley, D. 1996. Low maintenance roadblocks (plus 2 photos). *Lawn & Landscape* 17(2):48.
- Hensley, D. 1996. Preparation is the key to planting annuals. *T&O Service Tech* 1(2):8 plus photo.
- Hensley, D. 1996. Money-saving tips for new and existing landscapes. *Building Management Hawaii*. 13(7):26 plus photo.
- Hensley, D. 1996. Caring for bedding plants. *T&O Service Tech* 1(3):11,46 plus photo.
- Hensley, D. 1996. Maintenance efficiency results from design evaluation. *Hawaii Landscape* 10(4):4.
- Hensley, D. 1996. Commercial color provides a competitive edge. *T&O Service Tech* 1(3):11.
- Hensley, D. 1996. The keys to efficient leaf cleanup. *T&O Service Tech* 1(4):15.
- Hensley, D. 1996. Landscape management guidelines available. *Hawaii Landscape* 10(4):9.
- Hensley, D. 1996. Where to go for a soil test. *Hawaii Landscape* 10(4):11.
- Hensley, D., R. Nishimoto, and J. DeFrank. 1996. *Chemical weed control recommendations for turfgrasses in Hawaii*. CTAHR Instant Information Sheet No. 20.
- Hensley, D., J. Yogi, J. Tavares, and C. Murdoch. 1996. *Common lawn grasses for Hawaii*. CTAHR Instant Information Sheet No. 22.
- Hensley, D. and Landscape Industry Council of Hawaii. 1996. *Landscape Management Guidelines*. Copyrighted and printed by LICH, Honolulu, HI. 25 p.
- Hensley, D. 1997. *Wedelia*. CTAHR CES OF-2 (revised).
- Hensley, D. 1997. *Oleander*. CTAHR CES OF-4
- Hensley, D., J. Yogi, and J. DeFrank. 1997 *Perennial peanut groundcover*. CTAHR CES OF-23.
- Hensley, D. for J. Wilkinson. 1997. Aloha to the new Hawaii landscape! *Hawaii Landscape* 1(1):1.
- Hensley, D. 1997. Professionalism always victor over price cutting. *Hawaii Landscape* 1(1):4.
- Hensley, D. 1997. Drip irrigation saves water, money and plants. *Building Management Hawaii*. 14(1):19-20.

- Hensley, D. 1997. Design to reduce maintenance. *Landscape and irrigation*. 21(3)36-40.
- Hensley, D. 1997. Do root stimulators help transplanted trees? *Western Arborist*. 23(3)28.
- Hensley, D. 1997. Use of soil amendments in the landscape *Western Arborist*. 23(4)21.
- Hensley, D. 1997. Soil amendments and the landscape. *Hawaii Landscape* 1(1):9.
- Hensley, D. 1997. Grow native plants easily. *Hawaii Landscape* 1(1):9.
- Hensley, D. 1997. New publications from CTAHR Extension. *Hawaii Landscape* 1(1):10.
- Hensley, D and J. Yogi. 1997. Peat moss substitutions in Hawaii Nursery production. *Hawaii Landscape* 1(3):4.
- Hensley, D. 1997. NTBG to build visitor center. *Hawaii Landscape* 1(3):5.
- Hensley, D. 1997. UH offers tree selector software. *Hawaii Landscape* 1(3):9.
- Hensley, D. 1998. Travel grant offered to students. *Hawaii Landscape* 2(2):5.
- Hensley, D. 1998. Irrigation seminars on four islands. *Hawaii Landscape* 2(2):7.
- Hensley, D. 1998. Disciplining landscape employees. *Hawaii Landscape* 2(2):10.
- Hensley, D. 1998. 'Sunturf bermudagrass'. CTAHR CES TM-2 (revision of 1973 publication by Murdoch and Rauch).
- Hensley, D. and G. Meade, G. 1998. *Fertilizing trees and shrubs*. CTAHR CES L-6.
- Hensley, D. and J. Deputy. 1998. *Nandina*. . CTAHR CES OF-26.
- Holt, Thomas, Maynard, B.K. and W. A. Johnson. 1996. Rooting Rhododendron Without Mist: Subirrigation and Medium pH. *Proc. Int. Plant Prop. Soc.* 46:618-620.
- Holt, T.A. and B.K. Maynard 1997. Demonstrating the Treatment of Nursery and Aquaculture Effluent with Ornamental Plants. *Yankee Nursery Quarterly* 7(2):3-6.
- Holt, T.A., Maynard, B.K. and Johnson, W.A.. 1998. Low pH enhances rooting of stem cuttings of Rhododendron in subirrigation. *J. Envir. Horticulture* 16(1):4-7.
- Iles, J.K., W.R. Graves, A.S. Aiello, C.L. Haynes, and K.E. Stone. 1998. Midwestern retail garden centers identify satisfaction/dissatisfaction with supplying wholesale nurseries. *Journal of Environmental Horticulture*: in press.
- Iwata, R. and D. Hensley. 1996. AGNET Hawaii-Agricultural and horticultural information at your fingertips. *Hawaii Landscape* 10(4):10.
- Jeneidi F.M. and C.J. Starbuck. 1996. Comparison of the physical characteristics of growing media containing composted oak sawdust and sphagnum peat. *HortScience*. 31(4):657. (Abstract)
- Kjelgren, R. and D. R. Pittenger. 1997 (rev. 1998). Precision landscape irrigation. CD-ROM audio-visual presentation for use in teaching college classes and landscape industry workshops.

- Koreman, Paul, Art Cameron, Royal Heins, and Will Carlson. 1996. Manipulating photoperiod for height control: Here's a nonchemical technique for controlling the height of your perennials. *GrowerTalks* 60(10):58, 60.
- Leonhardt, K.W., V.M. Meade, and D.L. Hensley. 1996. New bougainvillea for Hawaii landscapes. *Hawaii Landscape* 10(3):6-7.
- Meade, V. and D. Hensley. 1997. *Selecting a Tree Care Professional*. 1997. CTAHR CES L-1.
- Meade, G. and D. Hensley. 1997. *Watering Trees*. CTAHR CES L-2.
- Meade, G. and D. Hensley. 1997. *Mulching for healthier landscape plants*. CTAHR CES L-3.
- Meade, G. and D. Hensley. 1997. *Planting a tree*. CTAHR CES L-4.
- Meade, G. and D. Hensley. 1998. *Staking and guying newly planted trees*. CTAHR CES L-7.
- Meade, G. and D. Hensley. 1998. *Pruning landscape trees and shrubs*. CTAHR CES L-8.
- Meade, G. and D. Hensley. 1998. *Using trees to save energy*. CTAHR CES L-5.
- Mulkern, K. and D. Hensley. 1997. Go with the flow. *Hawaii Landscape* 1(1):3.
- Nishimoto, R, D. Hensley, and J. DeFrank. 1998. *Nutgrass control in the lawn, landscape, and garden*. CTAHR SCM-2.
- Pemberton, H. B., G. L. Philley and W. E. Roberson. 1996. Compound, surfactant, and spray interval affect black spot control on rose. *HortScience* 31:676. Abstr.
- Pemberton, H. B., G. V. McDonald, and W. E. Roberson. 1996. Pack and garden trials for East Texas: Spring 1996. TX Ag. Expt. Stat. Tech. Rept. 96-2:1-2.
- Pemberton, H. B., D. H. Byrne, W. E. Roberson, and G. V. McDonald. 1996. Screening rose plant material for black spot resistance - 1996. TX Ag. Expt. Stat. Tech. Rept. 96-2:3-4.
- Pemberton, H. B., W. E. Roberson, and A. Oehlert. 1996. Rooting of *Rosa multiflora* Thunb. 'Brooks 56' hardwood cuttings in response to rooting compounds and storage 1994. TX Ag. Expt. Stat. Tech. Rept. 96-2:5-6.
- Pemberton, H. B., G. L. Philley, and W. E. Roberson. 1996. Control of black spot on roses with cyproconazole used as a drench. TX Ag. Expt. Stat. Tech. Rept. 96-2:9-10.
- Pemberton, H. B., G. L. Philley, and W. E. Roberson. 1996. Fungicide tests for black spot control on roses - 1994. TX Ag. Expt. Stat. Tech. Rept. 96-2:11-12.
- Pemberton, H. B., G. L. Philley, and W. E. Roberson. 1996. Fungicide tests for black spot control on roses - 1995. TX Ag. Expt. Stat. Tech. Rept. 96-2:13-14.
- Pemberton, H. B., G. L. Philley, and W. E. Roberson. 1996. Black spot control on roses with triforine EC. TX Ag. Expt. Stat. Tech. Rept. 96-2:7-8.
- Pemberton, H. B., T. M. Kyalo, and J. M. Zajicek. 1996. Potted miniature roses: Growing environment affects flowering and postharvest longevity. *Greenhouse Product News* 6(10):16-18.
- Pemberton, H. B., J. W. Kelly, and J. Ferare. 1997. Pot roses. In *Tips for growing specialty crops*. R. A. Larson, Ed. The Ohio Florist Association. Columbus, Ohio. Pages 112-121.

- Pemberton, H. B., Y. T. Wang and G. V. McDonald. 1997. Increase of easter lily postharvest flower longevity with PBA application to young flower buds. *HortScience* 32:458-459. Abstr.
- Pemberton, H. B., W. E. Roberson, and G. V. McDonald. 1998. Effect of preemergent herbicides on growth of dwarf nandina, eleagnus, Asiatic jasmine, bradford pear, and Arizona ash. *HortScience* 33:484. Abstr.
- Pemberton, H. B. and W. E. Roberson. 1998. Bedding plant pack and garden trials for East Texas: Spring 1998. TX Ag. Expt. Stat. Tech. Rept. 98-2:1-2.
- Pemberton, H. B., W. E. Roberson, and G. V. McDonald. 1998. Effect of preemergent herbicides on growth of dwarf nandina, eleagnus, Asiatic jasmine, bradford pear, and Arizona ash. TX Ag. Expt. Stat. Tech. Rept. 98-2:3-4.
- Pemberton, H. B., D. H. Byrne, and W. E. Roberson. 1998. Screening rose plant material for black spot resistance - 1997-98 trials. TX Ag. Expt. Stat. Tech. Rept. 98-2:5-6.
- Pemberton, H. B., G. L. Philley, and W. E. Roberson. 1998. Fungicide tests for black spot control on roses - 1996. TX Ag. Expt. Stat. Tech. Rept. 98-2:7-8.
- Pemberton, H. B., G. L. Philley, and W. E. Roberson. 1998. Fungicide tests for black spot control on roses - 1997. TX Ag. Expt. Stat. Tech. Rept. 98-2:9-11.
- Rauch, F., revised by D. Hensley. 1997. *Monstera*. CTAHR CES OF-5.
- Rauch, F., revised by D. Hensley. 1997. *Cormandel*. CTAHR CES OF-6.
- Rauch, F., revised by D. Hensley. 1997. *Hemigraphis*. CTAHR CES OF-7.
- Rosetta, R.L., S.E. Svenson and N.C. Bell. 1998. Evaluation of three soil-applied insecticides for root weevil control in container-grown nursery crops. *HortScience* 33(3):485 (abstr.).
- Runkle, Erik, Royal Heins, Art Cameron and Will Carlson. 1996. Manipulating day length to flower perennials. *Grower Talks* 60(2):66-70.
- Runkle, Erik, Royal Heins, Art Cameron and Will Carlson. 1998. Forcing perennials - crop by crop - *Astilbe*. *Greenhouse Grower*. 16(5):81-84.
- Smith, Louis, Paul Koreman, Alison Frane, Royal D. Heins, Art Cameron and Will Carlson. 1998. Forcing perennials - crop by crop - *Sedum spectabile* x telephium 'Autumn Joy'. *Greenhouse Grower*. 16(10):97-100.
- Schuch, U. K. and G. J. Klein. 1996. Wholesale nursery surveys reveal inventory, customers and business practices. *California Agriculture* 50(5):16-21.
- Svenson, S.E. 1996. Growth Regulators In Ornamental Crops. *Pacific Northwest Weed Control Handbook*. pp. 262-266.
- Svenson, S.E. 1996. Regulating Growth of Landscape Plantings. *Pacific Northwest Weed Control Handbook*. pp. 271-272.
- Svenson, S.E. 1996. Alternative Production Systems. *Proceedings of the Northwest Nursery Crops Research Center 2nd Annual Research Conference* (abstr.).
- Svenson, S.E. 1996. Water from the bottom up. *FarWest Magazine (The Digger)* 40(8):51-52.

- Svenson, S.E. 1996. Retractable roof production systems: greenhouse or outdoor production? *The Digger* 40(5):31-34.
- Svenson, S.E. 1996. Retractable roof production systems: managing for better growing. *The Digger* 40(6):23-27.
- Svenson, S.E. 1997. The North Willamette PLANT Program. *Landscape Plant News* 8(4):8-10.
- Svenson, S.E. 1997. The North Willamette Research and Extension Center. *Landscape Plant News* 8(4):11.
- Svenson, S.E. and R.L. Ticknor. 1997. Pieris: Consider these Cultivars. *The Digger* 41(11):27-28.
- Svenson, S.E. 1997. Consumers determine your profit. *The Digger* 41(10):25-30.
- Svenson, S.E. 1997. Adjustments to change determine profit. *The Digger* 41(9):17-22.
- Svenson, S.E. 1997. Price determines profit. *FarWest Magazine (The Digger)* 41(8):39-42.
- Svenson, S.E. 1997. Controlling liverworts and mosses. *GrowerTalks (January issue)* 60(11):65
- Svenson, S.E. 1997. Growth Regulators In Ornamental Crops. *Pacific Northwest Weed Control Handbook*. pp. 262-266.
- Svenson, S.E. 1997. Regulating Growth of Landscape Plantings. *Pacific Northwest Weed Control Handbook*. pp. 271-272.
- Svenson, S.E. 1997. Suppression of liverwort growth in containers by cinnamic aldehyde. *HortScience* 32(3):430 (abstr.)
- Svenson, S.E., D. Adams and R.L. Ticknor. 1997. Controlling root and weed growth in a nursery crop sandbed subirrigation system. *HortScience* 32(3):446 (abstr.)
- Svenson, S.E., D.G. Adams and R.L. Ticknor. 1997. Slow and steady. *American Nurseryman* 185(2):50-59.
- Svenson, S.E. 1998. Live loads and dead loads: Understanding Code. *Greenhouse Product News* 8(10):46-48 (October issue).
- Svenson, S.E. 1998. Scientists showcase the northwest nursery industry. *The Digger* 42(9):34-39 (September issue).
- Svenson, S.E. 1998. Energized Production. *NMPro* 14(9):51-53 (September issue).
- Svenson, S.E. 1998. Shade on demand. *NMPro* 14(8):55-59 (August issue).
- Svenson, S.E. 1998. Daphne. *NMPro* 14(8):10 (August issue).
- Svenson, S.E. and N. Bell. 1998. Seed money: Buy into collecting trips. *FarWest Magazine (The Digger)* 42(8):111-113 (August issue).
- Svenson, S.E. 1998. New *Daphne* to enter market. *FarWest Magazine (The Digger)* 42(8):97 (August issue).

- Svenson, S.E. 1998. Council cultivates interest in new plants. *FarWest Magazine (The Digger)* 42(8):93-96 (August issue).
- Svenson, S.E. 1998. Greenhouse weeds: Hope for the future. *The Digger* 42(6):42.
- Svenson, S.E. 1998. Greenhouse weed management II. Controlling existing weeds inside greenhouses. *The Digger* 42(6):38-41.
- Svenson, S.E. 1998. Greenhouse weed management I: Sanitation and prevention. *The Digger* 42(5):18-22.
- Svenson, S.E. and R.L. Ticknor. 1998. Pieris: Consider these cultivars. *Yankee Quarterly Newsletter* 7(4):12-13.
- Svenson, S.E. 1998. Growth Regulators In Ornamental Crops. *Pacific Northwest Weed Control Handbook*. pp. 256-260.
- Svenson, S.E. 1998. Regulating Growth of Landscape Plantings. *Pacific Northwest Weed Control Handbook*. pp. 265-266.
- Svenson, S.E. 1998. Interaction of irrigation frequency and container drainhole design on growth of three nursery crops. *Proceedings of the Southern Nursery Association Research Conference* 43:(in press.)
- Svenson, S.E., N. Bell and A. Henderson. 1998. Cold-trapping in retractable roof structures to avoid spring frost damage of container-grown nursery crops. *Proceedings of the Southern Nursery Association Research Conference* 43:(in press.)
- Svenson, S.E. 1998. Suppression of liverwort growth in containers using irrigation, mulches, fertilizers and herbicides. *HortScience* 33(3):484 (abstr.).
- Svenson, S.E. 1998. Interaction of irrigation frequency and container drainhole design on growth of three nursery crops. *HortScience* 33(3):473 (abstr.).
- Svenson, S.E., N. Bell and A. Henderson. 1998. Cold-trapping in retractable roof structures to avoid spring frost damage of container-grown nursery crops. *HortScience* 33(3):451 (abstr.).
- Tavares, J., D. Hensley, and C. Murdoch. 1998. *Seashore paspalum*. CTAHR CES TM-1.
- Wang, Shi-Ying, Royal D. Heins, Will Carlson, and Art Cameron. 1998. Forcing perennials - crop by crop - *Hibiscus moscheutos* 'Disco Belle Mixed'. *Greenhouse Grower*. 16(2):29-32.
- Wang, S.Y., R.D. Heins, W.H. Carlson and A.C. Cameron. 1998. Modeling the effect of temperature on flowering of *Hibiscus moscheutos*. *Crop Models in Protected Cultivation*. Ed. I.F.M. Marcelis. *Acta Hort.* 456:161-169.
- Whitman, C., R. Heins, A. C. Cameron, W. H. Carlson. 1997. Campanula, p. 43-46. In: M.L. Gaston, S.A. Carver, C.A. Irwin, and R.A. Larson (eds). *Tips on growing specialty potted crops*. The Ohio Florist's Association. Columbus, Ohio.
- Whitman, Catherine, Royal Heins, Art Cameron, William Carlson. 1996. Perennial flower induction - the light you use can make a difference. *Grower Talks* 60(3):80-82.
- Whitman, Catherine, Royal Heins, Art Cameron, and Will Carlson. 1996. Forcing Perennials -crop by crop - *Lavandula angustifolia*. *Greenhouse Grower*. 14(5):37-40.

- Whitman, Catherine, Royal D. Heins, Art Cameron, Will Carlson. 1996. Forcing Perennials - crop by crop - *Campanula carpatica* 'Blue Clips'. Greenhouse Grower. 14(9):67-70.
- Whitman, Catherine, Royal D. Heins, Art Cameron, Will Carlson. 1996. Forcing Perennials - crop by crop - *Platycodon grandiflorus* 'Sentimental Blue'. Greenhouse Grower. 14(10):39-42.
- Yuan, Mei, Erik S. Runkle, Royal D. Heins, Art Cameron, Will Carlson. 1996. Forcing Perennials - crop by crop - *Rudbeckia fulgida* 'Goldsturm'. Greenhouse Grower. 14(13):57-61.
- Yuan, M., Royal D. Heins, Art Cameron, and Will Carlson. 1996. Forcing perennials - crop by crop - *Coreopsis grandiflora*. Greenhouse Grower. 14(6):57-59.
- Yuan, Mei, Royal D. Heins, Will Carlson, and Art Cameron. 1996. Forcing perennials--crop by crop: *Gaillardia xgrandiflora* 'Goblin'. Greenhouse Grower. 14(14):57-60.

Addendum

WCC-058

Production, Transition Handling, and Re-establishment of Perennial Nursery Stock

1999

Communication and Cooperation Among Coordinating Committee

The Coordinating Committee members of WCC-058 interact and cooperate frequently between annual meetings. Members of the committee routinely formally and informally review each other's manuscripts and Experiment Station projects. Frequent communication by e-mail enables members to share problems and solutions rapidly. Most members of the Coordinating Committee also participate in the same regional and national meetings where information is shared. Other interaction includes joint projects and sabbatical leaves. Thus frequent communication is a regular part of the interaction of members of the Coordinating Committee.