

## Gary L. Hein Curriculum Vitae

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### Education:

Ph.D.	1984 Iowa State University, Ames, IA	Major: Entomology (minor, statistics)
M.S.	1981 Iowa State University, Ames, IA	Major: Entomology
B.A.	1976 Concordia College, Moorhead, MN	Major: Biology

### Employment:

Jan. 2009 - present	Director, Doctor of Plant Health Program University of Nebraska-Lincoln, Lincoln, NE (70% Admin., 30% Research)
1999-2008	Professor of Entomology, University of Nebraska-Lincoln Panhandle Research and Extension Center, Scottsbluff, NE (50% Research, 50% Extension) (11/07-12/08 Administrative Intern, PREC)
1993-1999	Associate Professor of Entomology, University of Nebraska (50% Research, 50% Extension)
1988-1993	Assistant Professor of Entomology, University of Nebraska (50% Research, 50% Extension)
1986-1988	Postdoctoral Research Associate, Plant Science Department, South Dakota State University (90% Research, 10% Teaching)

### Responsibilities:

#### Administration

Responsible for the administration of the Doctor of Plant Health Program offered at the University of Nebraska–Lincoln.

#### Research

Develop improved management strategies for the wheat curl mite and its vectored viruses in wheat. Emphasis is on determining aspects of biology and ecology that are relevant to the mite's pest status and its interaction with wheat streak mosaic epidemiology and the epidemiology of the other two viruses it transmits to wheat.

### **Professional Awards / Honors**

Teaching Award of Merit, North American Colleges and Teachers of Agriculture and UNL-CASNR, 2014  
Distinguished Extension Specialist - University of Nebraska Extension, 2008  
Excellence in Extension Team Programming Award (Cooperative Extension), 1992  
Crop Management Workshop  
Excellence in Extension Team Programming Award (Cooperative Extension), 1998  
Crop Management Workshop  
North Central Branch Nominee, Entomological Society of America (ESA) Distinguished Achievement Award in Extension (2002)  
Excellence in Extension Team Programming Award (Cooperative Extension), 2003  
Grasshopper Response Team  
Entomological Society of America  
- 1996 NCBESA Program Chair  
- Section F (Crop/Urban Pest Management)  
- 1997 Section Secretary/1998 Section Vice-Chair/1999 Section-Chair  
- President - North Central Branch - 2006-07  
Elected as Nebraska rep to North Central - SARE Administrative Council, 2000-02  
Blue Ribbon Award from Am. Soc. of Agric. Engineers 2002 Educational Aids Competition for 'Sugarbeet Production Guide'  
Certificate of Excellence Award 2002 from American Society of Agronomy for their contributions to 'Sugarbeet Production Guide.'

### **RESEARCH GRANT ACTIVITIES**

#### **Current Active Grants Related to Research**

G. Hein, S. Everhart, L. Giesler, D. Golick, T. Hunt, A. Jahla, D. Lee, L. Sandall	Bridging the Gap: Educating multidisciplinary professionals to steward pest management technologies for sustainable agriculture. USDA-NNF, June 2016 – June 2021.	\$238,500
Hein, G. L, et. al. (20 Co-PI's) six states and USDA-ARS	A Predictive Model To Increase Adoption of IPM of a Mite-Virus Disease Complex in Wheat. Management of Arthropod -or Nematodes-vectored Plant Pathogens. USDA-AFRI. January 2013 – December 2018	\$3,375,000
G. Hein	Advanced screening for evaluating wheat streak mosaic virus resistance for quality Nebraska wheats. Nebraska Wheat Board. 2007-17.	\$15,000/yr

**Federal and Special State Grant Support (since 1988)**

R. Wright, L. Meinke, G. Hein	Impact of the soil environment on survival of immature western corn rootworms. (NC-IPM, 1989-91)	\$48,723
G. Hein, N. Elliott	Russian wheat aphid population dynamics. (Cooperative research agreement with USDA-ARS, 1991-93)	\$21,000
E. Kerr, G. Hein, G. Binford, J. Smith, R. Wilson	Applied research on Rhizomania. (State of Nebraska, 1993-1995)	\$80,000
G. Hein, R. French, D. Lyon, J. Watkins	Wheat curl mite population dynamics and epidemiology of wheat streak mosaic. 5/1/94 - 4/30/96. (NC-IPM grant)	\$75,000
D. Yonts, R. Wilson, G. Binford, G. Hein	Control of pesticides and nitrates in surface irrigation runoff water. Burlington Northern Endowment Water Grant. 1994-1996.	\$37,000
M. Brewer, F. Peairs, G. Hein	Integration of host plant resistance and natural enemies for pest management in wheat and barley. USDA IPM Implementation Initiative.	\$20,000
T. Holtzer et al.	Ecologically based IPM in Dryland Cropping Systems. Western Regional IPM. (IPM Implementation Grant)	\$13,800
G. Hein, R. French, S. Jensen	Host, vector, and virus interactions for the wheat streak mosaic and high plains diseases of wheat. (Specific Cooperative Agreement with USDA-ARS, 1996-1999)	\$75,000
G. Hein, J. W. Amrine, R. French	Characterization of genetic, morphological and host range differences within and between wheat curl mite populations. North Central IPM Grants Program. 1998-2000.	\$68,136
G. Hein, R. French	Genetic variability of field populations of wheat curl mite and the impact on virus epidemiology. North Central Integrated Pest Management. 2004-2006.	\$96,467
G. Hein, S Wegulo, Q. Hu, D. Rundquist	Predicting wheat curl mite movement and wheat streak mosaic spread. North Central Integrated Pest Management. 2006-2009.	\$89,622
C. M. Smith, F. Peairs, G. Hein	Improved management of Russian wheat aphid in barley by integration of biological and cultural control with aphid	\$433,880

	resistant cultivars. CSREES-Crop at Risk Program. 2006-2009.	
Wright, R., T. Hunt, G. Hein, T. Jackson	Improved monitoring techniques and EIL's for western bean cutworm on field corn. North Central Integrated Pest Management. 2008-2011.	\$92,967
Wegulo, S., G. L. Hein, P.S. Baenziger, D. Seifers, and M. Langham.	Regional distribution and host range of Triticum mosaic virus, an emerging virus of wheat, and its potential impact on wheat production. USDA-AFRI Plant Biosecurity. March 2010 – February 2014.	\$621,284
G. Hein, G. Brewer, M. Lagrimini, J. Steadman	Doctor of Plant Health: Integrated practitioners for tomorrow's sustainable agricultural systems. USDA-NNF, Jan. 2010 - Dec. 2015.	\$234,000
N. C. Elliott, et al. (20 investigators)	Biologically Intensive areawide IPM of the Russian wheat aphid and greenbug. ARS Areawide Grants Program. 2001-2006 (extension granted through Oct 2008).	\$2.5M (6 states, ARS for 5 yrs)

Significant additional research support has been obtained from University, foundation, commodity board (Wheat Board, Dry Bean Commission, Western Sugar Research Committee, National Sunflower Assoc.) grants, and private industry support.

### Graduate Students

- Jose Barrigossi, Ph.D. 1997. Development of an IPM system for the Mexican bean beetle (*Epilachna varivestita* Mulsant) as a pest of dry beans (*Phaseolus vulgaris* L.) (Co-advised with Dr. Leon Higley)
- John A. Thomas, M.S. 2001. Influence of volunteer wheat plant condition on wheat curl mite movement in winter wheat.
- Benjawan Siriwetwivat, Ph.D. 2006. Interactions between the wheat curl mite, *Aceria tosichella* Keifer (Eriophyidae), and wheat streak mosaic virus and distribution of wheat curl mite biotypes in the field. (Co-advised with Dr. John Foster)
- Rosana Serikawa, M. S. 2007. Genetic variation between different populations of the sugarbeet root aphid (*Pemphigus betae* Doane) across North America. (Co-advised with Dr. John Foster)
- Abby Stilwell, Ph.D. 2009. Remote sensing to detect the movement of wheat curl mite through the spatial spread of virus symptoms and identification of thrips as predators of wheat curl mites. University of Nebraska – Lincoln. PhD. Dissertation, 185 pp. (Co-advisor with Stephen Danielson)
- Justin McMechan, M. S. 2012. Efficiency of wheat curl mite haplotypes at transmission of Triticum mosaic virus in wheat. University of Nebraska - Lincoln.

Camila De Oliveira, M.S. 2013. Impact of wheat streak mosaic and Triticum mosaic viruses on transmission by *Aceria tosichella* and virus epidemiology. University of Nebraska - Lincoln.

Johannes Pretorius, Ph.D. 2014. The influence of tillage on beneficial, edaphic insect communities in sugar beets in western Nebraska. University of Nebraska–Lincoln. (Co-advised with Dr. Jeffrey Bradshaw)

Justin McMechan, Ph.D. 2016. Overwintering (green bridge) ecology of the wheat curl mite (*Aceria tosichelle* Keifer). University of Nebraska–Lincoln.

Christopher McCullough, M.S. 2017. Movement of wheat stem sawfly in western Nebraska. University of Nebraska–Lincoln. (Co-advised with Dr. Jeffrey Bradshaw)

Elliot Knoell, M.S. 2018. Transmission characteristics of Triticum mosaic virus by the wheat curl mite and ecology of the wheat-mite virus complex on field corn. University of Nebraska-Lincoln.

In addition to these students I have served on several graduate committees for students at UNL, Colorado State University, and Chadron State University.

## Refereed Publications

### Journal Articles

1. Hein, G. L., and J. J. Tollefson. 1984. Comparison of adult corn rootworm (Coleoptera: Chrysomelidae) trapping techniques as population estimators. *Environ. Entomol.* 13:268-273.
2. Ostlie, K. R., G. L. Hein, L. G. Higley, L. V. Kaster, and W. B. Showers. 1984. European corn borer (Lepidoptera: Pyralidae) development, larval survival, and adult vigor on diets containing marker dyes. *J. Econ. Entomol.* 77:118-120.
3. Hein, G. L., and J. J. Tollefson. 1985. The use of the Pherocon AM trap as a scouting tool for predicting subsequent corn rootworm (Coleoptera: Chrysomelidae) larval damage. *J. Econ. Entomol.* 78:200-203.
4. Hein, G. L., and J. J. Tollefson. 1985. Seasonal oviposition of the northern and western corn rootworms (Coleoptera: Chrysomelidae) in continuous cornfields. *J. Econ. Entomol.* 78:1238-1241.
5. Hein, G. L., M. K. Bergman, R. G. Bruss, and J. J. Tollefson. 1985. An absolute sampling technique for corn rootworm (Coleoptera: Chrysomelidae) adult emergence that adjusts to fit common-row spacings. *J. Econ. Entomol.* 78:1503-1506.
6. Hein, G. L., J. J. Tollefson, and P. N. Hinz. 1985. Design and cost considerations in the sampling of northern and western corn rootworm (Coleoptera: Chrysomelidae) eggs. *J. Econ. Entomol.* 78:1495-1499.

7. Foster, R. E., J. J. Tollefson, J. P. Nyrop, and G. L. Hein. 1986. Value of adult corn rootworm (Coleoptera: Chrysomelidae) population estimates in pest management decision making. *J. Econ. Entomol.* 79:303-310.
8. Hein, G. L., and J. J. Tollefson. 1987. Model of the biotic potential of western corn rootworm (Coleoptera: Chrysomelidae) adult populations and its use in studying population dynamics. *Environ. Entomol.* 16:446-452.
9. Hein, G. L., J. J. Tollefson, and R. E. Foster. 1988. Adult northern and western corn rootworm (Coleoptera: Chrysomelidae) population dynamics and oviposition. *J. Kans. Entomol. Soc.* 61:214-223.
10. Beregovoy, V. H., G. L. Hein, and R. Hammond. 1989. Variations in flight phenology and new data on the distribution of the banded sunflower moth (Lepidoptera: Cochylidae). *Environ. Entomol.* 18:273-277.
11. Lance, D. R., N. C. Elliott, and G. L. Hein. 1989. Flight activity of *Diabrotica* spp. at the borders of corn fields and its relation to ovarian stage in *D. barberi*. *Entomol. exp. appl.* 50:61-67.
12. Gray, M. E., G. L. Hein, D. D. Walgenbach, and N. C. Elliott. 1990. Effects of Russian wheat aphid *Diuraphis noxia* (Homoptera:Aphididae) on winter wheat and spring wheat infested during different plant growth stages under greenhouse conditions. *J. Econ. Entomol.* 83:2434-2442.
13. Elliott, N. C. and G. L. Hein. 1991. Population dynamics of the western corn rootworm: formulation, validation, and analysis of a simulation model. *Ecol. Modelling.* 59:93-122.
14. Gray, M. E., D. D. Walgenbach, A. Carrick, N. N. Troxclair, and G. L. Hein. 1991. European corn borer (Lepidoptera:Pyralidae) moth captures in aerial water-pan traps, influenced by replacement of pheromone at different intervals. *J. Econ. Entomol.* 84:1196-1202.
15. Wilson, R. G. and G. L. Hein. 1991. Effect of herbicides and insecticides applied to sugar beets at planting. *J. Sugar beet Res.* 28: 115-128. (JS No. 9566)
16. Boetel, M. A., D. D. Walgenbach, G. L. Hein, B. W. Fuller, and M. E. Gray. 1992. Oviposition site selection of the northern corn rootworm (Coleoptera: Chrysomelidae). *J. Econ. Entomol.* 85: 246-249.
17. Legg, D. E., G. L. Hein, R. M. Nowierski, M. G. Feng, F. B. Peairs, M. Karner, and G. W. Cuperus. 1992. Binomial regression models for spring and summer infestations of the Russian wheat aphid (Homoptera: Aphididae) in the southern and western plains states and Rocky Mountain region of the United States. *J. Econ. Entomol.* 85:1779-1790. (JS No. 9643)
18. Gray, M. E., G. L. Hein, M. A. Boetel, and D. D. Walgenbach. 1992. Western and northern corn rootworm (Coleoptera: Chrysomelidae) egg densities at three soil depths: implications for future ecological studies. *J. Kans. Entomol. Soc.* 65:354-356.

19. Hein, G. L. 1992. Influence of plant growth stage on Russian wheat aphid, *Diuraphis noxia* (Homoptera: Aphididae), reproduction and damage symptom expression. *J. Kans. Entomol. Soc.* 65:369-376. (JS No. 9707)
20. Legg, D. E., R. M. Nowierski, M. G. Feng, F. B. Peairs, G. L. Hein, L. R. Elberson, and J. B. Johnson. 1994. Binomial sequential sampling plans and decision support algorithms for managing Russian wheat aphid (Homoptera: Aphididae) in small grains. *J. Econ. Entomol.* 87: 1513-1533. (JS No. 9859)
21. Hein, G. L., N. C. Elliott, G. J. Michels, Jr., and R. W. Kieckhefer. 1995. A general method for estimating cereal aphid populations in small grain fields based on frequency of occurrence. *Can. Entomol.* 127: 59-63. (JS No. 10594)
22. Godfrey, L. D., L. J. Meinke, R. J. Wright, and G. L. Hein. 1995. Environmental and edaphic effects on western corn rootworm (Coleoptera: Chrysomelidae) overwintering egg survival. *J. Econ. Entomol.* 88: 1445-1454. (JS No. 10923)
23. Hein, G. L. and R. G. Wilson. 1996. Effects of insecticide placement on the phytotoxicity of planting time insecticides and their interaction with herbicides. *J. Sugar Beet Res.* 32 185-199.
24. McNeil, J. E., R. French, G. L. Hein, P. S. Baenziger, and K. M. Eskridge. 1996. Characterization of genetic variability among natural populations of wheat streak mosaic virus. *Phytopathology* 86:1222-1227. (JS No. 11497)
25. Mahmood, T., G. L. Hein, and R. C. French. 1997. Development of serological procedures for rapid and reliable detection of wheat streak mosaic virus in a single wheat curl mite. *Plant Disease* 81:250-253. (JS No. 11629)
26. Fuller, B. W. , M. A. Boetel, D. D. Walgenbach, J. A Grundler, G. L .Hein, K. J. Jarvi, A. J. Keaster, D. A. Landis, L. J. Meinke, J. D. Oleson, K. R. Ostlie, J. J .Tollefson, J. L. Wedberg, G. E. Wilde, and P. D. Evenson. 1997. Optimization of soil insecticide rates for managing corn rootworm (Coleoptera: Chrysomelidae) larvae in the North Central United States. *J. Econ. Entomol.* 90:1332-1340.
27. Elliott, N. C., G. L. Hein, M. C. Carter, J. D. Burd, T. J. Holtzer, J. S. Armstrong, and D. A. Waits. 1998. Russian wheat aphid (Homoptera: Aphididae) ecology and modeling in Great Plains agricultural landscapes. Pp. 31-64. In S. S. Quisenberry and F. B. Peairs [eds], *Response model for an introduced pest - the Russian wheat aphid*. Thomas Say Publ. in Entomology: Proceedings, Entomological Society of America, Lanham, MD.
28. Hein, G. L. 1998. Importance of technology transfer with a serious introduced pest, pp. 429-437. In S. S. Quisenberry and F. B. Peairs [eds], *Response model for an introduced pest - the Russian wheat aphid*. Thomas Say Publ. in Entomology: Proceedings, Entomological Society of America, Lanham, MD.
29. Mahmood, T., G. L. Hein, and S. G. Jensen. 1998. Mixed infection of wheat with high plains virus and wheat streak mosaic virus from wheat curl mites in Nebraska. *Plant Dis.* 82:311-315.

30. Downard, R. W., D. W. Morishita, A. G. Dexter, R. Wilson, and G. L. Hein. 1999. Interaction between triflurosulfuron and organophosphate or carbamate insecticides in sugar beet. *J. Sugar Beet Res.* 36(4): 47-81.
31. Choi, I., R. French, G. L. Hein, and D. C. Stenger. 1999. Fully biologically active in vitro transcripts of the Eriophyid mite-transmitted wheat streak mosaic tritivirus. *Phytopathology* 89:1182-1185. (JS#12636)
32. Barrigossi, J. A. F., G. L. Hein, and L. G. Higley. 2001. Life tables and larval dispersal of Mexican bean beetle (Coleoptera: Coccinellidae) on dry beans in the high plains. *Environ. Entomol.* 30(2): 235-243. (JS# 12075)
33. Barrigossi, J. A. F., L. A. Young, C. A. Gotway Crawford, G. L. Hein, and L. G. Higley. 2001. Spatial and probability distribution of Mexican bean beetle (Coleoptera: Coccinellidae) egg mass populations in dry beans. *Environ. Entomol.* 30(2): 244-253. (JS #12073)
34. Choi, I., J. S. Hall, M. Henry, L. Zhang, G. L. Hein, R. French, and D. C. Stenger. 2001. Contributions of genetic drift and negative selection on the evolution of three strains of wheat streak mosaic tritivirus. *Arch. Virol.* 146: 619-828. (JS # 12937)
35. Hall, J. S., R. French, G. L. Hein, T. J. Morris and D. C. Stenger. 2001. Three distinct mechanisms facilitate genetic isolation of sympatric wheat streak mosaic virus lineages. *Virolog.* 282: 230-236. (JS# 13199)
36. Baenziger, R. S., B. Moreno-Sevilla, C. J. Peterson, D. R. Shelton, R. W. Elmore, P. T. Nordquist, R. N. Klein, D. D. Baltensperger, L. N. Nelson, D. V. McVey, J. E. Watkins, G. Hein, J. H. Hatchett. 2001. Registration of 'Millennium' wheat. *Crop Sci.* 41: 1367-1369. (JS# 13069)
37. Charlet, L. D., J. S. Armstrong and G. L. Hein. 2002. Sunflower stem weevil and its larval parasitoids in the Central and Northern Plains of the USA. *BioControl* 47: 513-523.
38. Harveson, R. M., G. L. Hein, J. A. Smith, R. G. Wilson, and C. D. Yonts. 2002. An integrated approach to cultivar evaluation and selection for improving sugar beet profitability. *Pl. Disease* 86: 192-204. (JS# 13458)
39. Erayman, M., P.S. Baenziger, R. French, and G. L. Hein. 2003. Application of mobile nursery method to determine temporal and spatial genetic variability of wheat streak mosaic virus in Nebraska. *Cereal Res. Comm.* 31: 105-112. (JS# 13769)
40. Barrigossi, J. A. F., G. L. Hein, and L. G. Higley. 2003. Economic injury levels and sequential sampling plans for Mexican bean beetle (Coleoptera: Coccinellidae) on dry beans. *J. Econ. Entomol.* 96:1160-1167. (JS# 13753)
41. Thomas, J. A. and G. L. Hein. 2003. Influence of volunteer wheat plant condition on wheat curl mite movement in winter wheat. *Exp. Applied Acarology* 31:253-268. (JS# 13893)
42. Hein, G. L. and R. G. Wilson. 2004. Impact of *Ceutorhynchus litura* feeding on root carbohydrate levels in Canada thistle (*Cirsium arvense*). *Weed Science* 52:628-633. (JS# 14179)



43. Thomas, J. A., Hein, G. L., and Lyon, D. J. 2004. Spread of wheat curl mite and wheat streak mosaic virus is influenced by volunteer wheat control methods. Online. Plant Health Progress doi:10.1094/PHP-2004-1206-01-RS. (JS#14719)
44. Siles, M. M., W. K. Russell, D. D. Baltensperger, L. A. Nelson, B. Johnson, L. D. Van Vleck, S. G. Jensen, and G. Hein. 2004. Heterosis for grain yield and other agronomic traits in foxtail millet. *Crop Sci.* 44:1960-1965.
45. Bregitzer, P, D. W. Mornhinwig, R. Hammon, M. Stack, D. D. Baltensperger, G. L. Hein, M. K. O'Neill, J. C. Whitmore, and D. J. Fiedler. 2005. Registration of 'Burton' barley. *Crop Sci.* 45: 1166-1167.
46. Stenger, D. C., G. L. Hein, F. E. Gildow, K. M. Horken, and R. French. 2005. Plant virus HC-Pro is a determinant of Eriophyid mite transmission. *J. Virology* 79: 9054-9061.
47. Lanier, W. T., M. J. Brewer, F. B. Peairs, G. L. Hein, H. F. Schwartz, J. B. Campbell and S. Blodgett. 2006. Development and assessment of an on-line High Plains integrated pest management guide for a regional audience. *Am. Entomol.* 52:30-35.
48. Stenger, D. C. G. L. Hein, and R. French. 2006. Nested deletion analysis of wheat streak mosaic virus HC-Pro: mapping domains affecting polyprotein processing and eriophyid mite transmission. *Virology* 350:465-474.
49. Divis, L. A., R. A. Graybosch, C. J. Peterson, P. S. Baenziger, G. L. Hein, B. B. Beecher and T. J. Martin. 2006. Agronomic and quality effects in winter wheat of a gene conditioning resistance to wheat streak mosaic. *Euphytica* 152:41-49.
50. Young, B. A., G. L. Hein, R. French, D. C. Stenger. 2007. Substitution of conserved cysteine residues in wheat streak mosaic virus HC-Pro abolishes virus transmission by the wheat curl mite. *Arch. Virology* 152:2107-2111.
51. Krumm, J. T., T. E. Hunt, S. R. Skoda, G. L. Hein, D. L. Lee, P. L. Clark, and J. E. Foster. 2008. Genetic variability of the European corn borer, *Ostinia nubilalis*, suggests gene flow between populations in the Midwestern United States. *J. Insect Science* 8:69, available online: [insectscience.org/8.69](http://insectscience.org/8.69).
52. Baenziger, P.S., R. A. Graybosch, I. Dweikat, S. N. Wegulo, G. L. Hein, and K. M. Eskridge. 2008. Outstanding in their field: the phenotype of the 21st Century plant breeder. In R. Appels, R. Eastwood, E. Lagudah, P. Langridge, M. Mackay, and L. McIntyre (ed) Proc. 11th International Wheat Genetics Symposium. August 24 -29, 2008. Brisbane, Australia. <http://ses.library.usyd.edu.au/bitstream/2123/3325/1/O51.pdf>
53. Graybosch, R.A., C.J. Peterson, P. S. Baenziger, D. D. Baltensperger, L. A. Nelson, Y. Jin, J. Kolmer, B. Seaborn, R. French, G. Hein, T.J. Martin, B. Beecher, T. Schwarzacher and P. Heslop-Harrison. 2009. Registration of 'Mace' hard red winter wheat. *Journal of Plant Registrations* 3:51-56.
54. Mornhinweg, D. W., P. P. Bregitzer, D. R. Porter, F. B. Peairs, D. D. Baltensperger, G. L. Hein, T. A. Randolph, M. Koch, and T. Walker. 2009. Registration of 'Sidney' spring feed barley resistant to Russian wheat aphid. *J. Plant Regist.* 3(3): 214-218.
55. Tatineni, S., Graybosch, R. A., Hein, G. L., Wegulo, S. N., and French, R. 2010. Wheat cultivar-specific disease synergism and alteration of virus accumulation during co-

- infection with Wheat streak mosaic virus and Triticum mosaic virus. *Phytopathology* 100:230-238.
56. Tatineni, S., McMechan, J. A., Hein, G. L., and French, R. 2011. Efficient and stable expression of GFP through Wheat streak mosaic virus-based vectors in cereal hosts using a range of cleavage sites: formation of dense fluorescent aggregates for sensitive virus tracking. *Virology* 410: 268-281.
  57. Paula-Moraes, S., E. C. Burkness, T. E. Hunt, R. J. Wright, G. L. Hein, and W. D. Hutchison. 2011. Cost-effective binomial sampling of western bean cutworm, *Striacosta albicosta* (Lepidoptera: Noctuidae), egg masses in corn. *J. Econ. Entomol.* 104: 1900-1908.
  58. Hutchison, W. D., T. E. Hunt, G. L. Hein, K. L. Steffey, C. D. Pilcher, and M. E. Rice. 2011. Genetically engineered Bt corn and range expansion of the western bean cutworm (Lepidoptera: Noctuidae) in the United States: a response to Greenpeace Germany. *J. Int. Pest Man.* 2(3): DOI: <http://dx.doi.org/10.1603/IPM11016>.
  59. Backoulau, G. F., N. C. Elliott, K. L. Giles, V. Catana, M. Phoofolo, F. N. Peairs, and G. L. Hein. 2010. Relationship between Russian wheat aphid population density and edaphic and/or topographic characteristics within wheat fields. *Southwestern Entomol.* 35: 11-18.
  60. Byamukama, E., T. Satyanarayana, G. L. Hein, R. A. Graybosch, P. S. Baenziger, R. French, and S. Wegulo. 2012. Effects of single and double infections of winter wheat by *Triticum mosaic virus* and *wheat streak mosaic virus* on yield determinants. *Plant Dis.* 96: 859-864.
  61. Hein, G. L., R. French, B. Siriwetwivat, J. W. Amrine. 2012. Genetic characterization of North American Populations of the Wheat Curl Mite and Dry Bulb Mite. *Journal of Economic Entomology* 105(5):1801-1808.
  62. Paula-Moraes, S.V., T. E. Hunt, R. J. Wright, G. L. Hein, E. E. Blankenship. 2012. On-Plant Movement and Feeding of Western Bean Cutworm (Lepidoptera: Noctuidae) Early Instars on Corn. *Environmental Entomology* 41(6):1494-1500 DOI: <http://doi.10.1603/EN1249>.
  63. Byamukama, E., D. L. Seifers, G. L. Hein, E. De Wolf, N. A. Tisserat, M. A. C. Langham, L. E. Osborne, A. Timmerman, S. N. Wegulo. 2013. Occurrence and Distribution of *Triticum mosaic virus* in the Central Great Plains. *Plant Disease* 97(1):21-29 DOI: <http://dx.doi.org/10.1094/PDIS-06-12-0535-RE>.
  64. Navia, D., R. S. de Mendonca, A. Skoracka, W. Szydło, D. Knihinicki, G. L. Hein, P.R. V. da Silva Pereira, G. Truol, D. Lau. 2013. Wheat curl mite, *Aceria tosichella*, and transmitted viruses: an expanding pest complex affecting cereal crops. *Experimental and Applied Acarology* 59(1-2):95-143 DOI: <http://10.1007/s10493-012-9633-y>.
  65. Stilwell, A. R., G. L. Hein, A. I. Zygielbaum, D. C. Rundquist. 2013. Proximal sensing to detect symptoms associated with wheat curl mite-vectored viruses. *International Journal of Remote Sensing*, 34: 4951-4966. DOI: <http://dx.doi.org/10.1080/01431161.2013.783945>

66. Paula-Moraes, S., T. Hunt, R. Wright, G. L. Hein, E. Blankenship. 2013. Western bean cutworm survival and the development of economic injury levels and economic thresholds in field corn. *Journal of Economic Entomology*, 106(3): 1274-1285. DOI: <http://dx.doi.org/10.1603/EC12436>
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92. Skoracka, A., B. G. Rector and G. L. Hein. 2018. The Interface Between Wheat and the Wheat Curl Mite, *Aceria tosichella*, the Primary Vector of Globally Important Diseases. *Frontiers in Plant Science* 9: 1098 1-8. DOI: <https://doi.org/10.3389/fpls.2018.01098>
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96. Gupta, A. K., G. L. Hein, and S. Tatineni. 2019. P7 and P8 proteins of High Plains wheat mosaic virus, a negative-strand RNA virus, employ distinct mechanisms of RNA silencing suppression. *Virology* 535: 20-31. DOI: <https://doi.org/10.1016/j.virol.2019.06.011>
97. Gupta, A. K., E. D. Scully, N. A. Palmer, S. M. Geib, G. Sarath, G. L. Hein, and S. Tatineni. 2019. *Wheat streak mosaic virus* alters the transcriptome of its vector, wheat curl mite (*Aceria tosichella* Keifer), to enhance mite development and population expansion. *J. General Virology*. *J. General Virology* 100: 889-910. <https://doi.org/10.1099/jgv.0.001256>

## Book Chapters – Research

- Harris, M.O., K. Anderson, M. El-Bouhssini, F. Peairs, G. Hein, and S. Xu. 2017. Wheat pests: insects, mites and prospects for the future. *In* Achieving sustainable cultivation of wheat Volume 1: Breeding, quality traits, pests and diseases, P. Langridge (ed.). Burleigh

Dodds Science Publishing, Cambridge, UK (ISBN: 978 1 78676 016 6;  
www.bdspublishing.com), pp. 467-544.

Stenger, D. C., G. L. Hein, S. Tatineni, and R. French. 2016. Eriophyid Mite Vectors of Plant Viruses. Pages 263-274, *In: Vector-Mediated Transmission of Plant Pathogens*. J. K. Brown (ed). The American Phytopathological Society.

Catana, V., N. Elliott, K. Giles, M. Mirik, D. Porter, G. Hein, F. Peairs, and J. Michels. 2008. The role of databases in areawide pest management. Pages 142-158, *In: O. Koul, G. W. Cuperus, and N. Elliott (eds) Areawide Pest Management: Theory and Implementation*. CAB International, Wallingford Oxfordshire, UK.

Giles, K., G. L. Hein, and F. Peairs. 2008. Areawide pest management of cereal aphids in dryland wheat systems of the Great Plains. Pages 441-466, *In: O. Koul, G. W. Cuperus, and N. Elliott (eds) Areawide Pest Management: Theory and Implementation*. CAB International, Wallingford Oxfordshire, UK.

Hein, G. L. and J. F. Witkowski. 1994. Chlorpyrifos use on wheat, pp. 80-82. *In: The Biologic and Economic Assessment of the Field Crop Usage of Chlorpyrifos*. J. F. Witkowski, S. P. Whitney, and T. J. Kergel, Eds. USDA-NAPIAP (May).

Elliott, N. C., G. L. Hein, and B. M. Shepard. 1993. Sampling insect pests of wheat and rice, pp. 633-672. *In: Handbook of Sampling Methods for Arthropod Pests in Agriculture*. L. P. Pedigo and G. D. Buntin eds. CRC Press, Boca Raton, FL.

### **Invited Presentations (Since 2000)**

Hein, G. L. 2000. Managing wheat streak with an understanding of the wheat curl mite. Presented at the Southwest Research and Education Consortium annual meeting. April 11, Garden City, KS.

Hein, G. L. 2000. Impacts of crop rotation on arthropod pests in dryland crops. Presented at the Annual Meeting of the Entomological Society of America, Dec. 3-6, Montreal, Canada.

Hein, G. L. and J. Thomas. 2002. Wheat curl mite movement and its impact on wheat streak mosaic virus epidemiology. Presented at the XI International Congress of Acarology, 8-13 September, Merida, Mexico.

Hein, G. 2003. Identifying target strategies for sugar beet root maggot management. Presented at the Annual Meeting of the Entomol. Soc. Am. Cincinnati, OH, Oct. 26-29, 2003.

Hein, G., J. Thomas, and W. Stroup. 2004. Effects of tillage on wheat stem sawfly survival and emergence in the central high plains. Presented at the Annual Meeting of the Pacific Branch of the Entomological Society of America, June 20-23, Bozeman, MT.

Hein, G. L., R. French, and B. Siriwetwivat. 2004. Managing a wheat-mite-virus complex: the need to understand the basics. Presented at the XX International Congress of Entomology, August 15-21, Brisbane, Australia.

Hein, G. L. 2004. Wheat curl mite ecology and wheat streak epidemiology. Presented at the

- Queensland Department of Primary Industries. August 19, Indooroopilly, QLD, Australia.
- Hein, G. L. 2004. Wheat curl mite ecology and wheat streak epidemiology. Presented at the Commonwealth Scientific and Industrial Research Organization (CSIRO). August 24, Canberra, ACT, Australia.
- Hein, G. L. 2005. Wheat curl mite and wheat streak mosaic virus: examining old dogs with new tricks! Presented to the Department of Bioagricultural Sciences and Pest Management, November 30, Ft. Collins, CO.
- Hein, G. L. 2006. Managing an invisible killer: wheat curl mite and wheat streak mosaic virus. Presented to the Department of Entomology, Univ. Nebraska-Lincoln, January 23, Lincoln, NE.
- Hein, G. L. 2006. Integrated management of wheat curl mite and wheat streak mosaic virus. Presented to the North Central Region Integrated Pest Management Coordinators Meeting, April 3, St. Louis, MO.
- Hein, G. L., B. Siritwetwivat, and R. French. 2006. Biological factors associated with host (biotype) differences for wheat curl mite (*Aceria tosichella*). Presented at the 12<sup>th</sup> International Congress of Acarology, August 21-26, Amsterdam, Netherlands.
- Hein, G. L., B. Siritwetwivat, and R. French. 2007. Resistance in wheat to the wheat curl mite: Is biotype development inevitable? Presented at the Annual Meeting of the North Central Branch of the Entomological Society of America, March 25-28, Winnipeg, MB.
- Hein, G. L., R. French, B. Siritwetwivat, and A. Stilwell. 2010. Biology, phylogenetics and distribution of wheat curl mite populations. Presented at the Joint Congress of the Hard Winter Wheat Workers Workshop and the National Wheat Genomics Workshop, March 7-10, Lincoln, NE.
- Hein, G. L. 2010. Doctor of Plant Health: a professional program for plant health practitioners. Seminar presented at USDA-NIFA, Waterfront Center, June 29, Washington, DC.
- Hein, G. L., R. J. McGovern, and N. C. Leppla. 2011. Expanding educational and career opportunities for international IPM practitioners. Presented at the Joint Meeting of the American Phytopathological Society and the International Plant Protection Congress, Aug. 6-10, Honolulu, HA.
- Hein, G. L. 2011. Professional doctoral program for plant practitioners. Presented at the University of Hawaii at Manoa, Honolulu, HA, August 12.
- Hein, G. L. 2012. Wheat Spreak Mosaic Virus and the Wheat Curl Mite. Presented at the Western Crop and Pest Management School, March 7, Minot, N.D.
- Hein, G. L. 2012. Doctor of Plant Health Program Update. Presented at the Nebraska Independent Crop Consultant Association Annual Meeting, December 4, Kearney, NE.
- Hein, G. L., McMechan, A. J., de Oliveira, C. F., French, R., Wosula, E. N. 2013. Biology and ecology of the wheat curl mite and implications on the management of a complex of viruses in wheat. Presented at Montana State University, Dept. of Plant, Soil, and Microbial Sciences, Bozeman, MT., March 19.

- Hein, G. L., A. J. McMechan, C. F. de Oliveira, R. French, E. N. Wosula. 2013. Wheat curl mite interactions with wheat and wheat viruses. Presented at the North Central Branch meeting of The Entomological Society of America, Rapid City, SD., June 17.
- Hein, G. L. 2013. Gone with the wind: Implications of wheat curl mite movement on the management of a complex of viruses in wheat. Presented at the NCERA213: Migration and Dispersal of Agriculturally Important Biota (NCR-148), Scottsbluff, NE., October 3.
- Hein, G. L. 2014. The University of Nebraska's DPH Program: Professional leadership for sustainable plant production systems. Presented at the 62<sup>nd</sup> Annual Meeting of The Entomological Society of America, Portland, OR., November 18.
- Hein, G. L. and A. C. Hodges. 2015. Novel education for the next generation of IPM practitioners. Presented at IPM: Solutions for a Changing World, Integrated Pest Management, Salt Lake City, UT. March 25.
- Hein, G. L. 2015. Educational needs for integrated management of sustainable production systems. Presented at the XVIII International Plant Protection Congress, Berlin, Germany. August 27.
- Hein, G. L. 2015. Mites-Virus-Plant Health: Transcending disciplines to impact your food supply... and potentially, your career. Presented at Nebraska Wesleyan University Biology Seminar, Lincoln, NE. November 10.
- Hein, G. L. 2015. Ecology of wheat curl mite in the agroecosystem and virus epidemiological implications. Presented at Pioneer Hi-Bred International, Johnston, IA. November 12.
- Hein, G. L. 2015. *Aceria tosichella*: Cryptic but diverse. Presented at Synergy in Science: Partnering for Solutions, 63<sup>rd</sup> Annual Meeting of the Entomological Society of America, Minneapolis, MN. November 15.
- Hein, G. L. 2016. Building Leaders for the Future of Agriculture. Presented at the National Alliance of Independent Crop Consultants annual meeting, Lake Buena Vista, FL. January 29.
- Hein, G. L., A. J. McMechan, E. Wosula, C. Oliveira Hofman. 2016. Complexity of virus transmission to wheat by the wheat curl mite, *Aceria tosichella*. Presented at the North Central Branch meeting of Entomological Society of America annual meeting, Cleveland, OH. June 6.
- Hein, G. L. and T. Hunt. 2017. Building Leaders for the Future of Agriculture. Presented at Graduate Student Workshop, Instituto Federal Goiano, Urutai, Brazil. (delivered via Skype) October 19.

#### **Contributed Presentations or Papers Related to Research (Since 2000)**

- Hein, G. L., R. Harveson, J. A. Smith, R. G. Wilson, and C. D. Yonts. 2000. Response of sugarbeet varieties to sugarbeet root aphid populations in the field. Presented at the 14th Biennial International Plant Resistance to Insects Workshop, Feb. 28-Mar. 2, Ft. Collins, CO.
- Hein, G. L., R. Harveson, J. A. Smith, R. G. Wilson, and C. D. Yonts. 2000. Varietal



- resistance to sugarbeet root aphid. Presented at Annual Meeting of North Central Branch of Entomological Society of America, March 26-29, Minneapolis, MN.
- Thomas, J. A. and G. L. Hein. 2000. Influence of host quality on wheat curl mite movement. Presented at Annual Meeting of North Central Branch of Entomological Society of America, Mar. 26-29, Minneapolis, MN. (*Won 2nd Place in Master's Degree Poster Competition*)
- Tolmay, V. L., R. Mare, and G. L. Hein. 2000. Russian wheat aphid in South Africa - Is there a biotype? Presented at the 14th Biennial International Plant Resistance to Insects Workshop, February 28-March 2, Ft. Collins, CO.
- Hein, G. L. And J. A. Thomas. 2000. Dispersal of an Eriophyid mite, the wheat curl mite, and its importance to disease epidemiology. Presented at the XIX International Congress of Entomology, August 20-26, Iguassu Falls, Brazil.
- Hein, G. L. and C. D. Yonts. 2001. Factors influencing sugarbeet root aphid populations and the aphids' impact on sugarbeet yield. Presented at the 31<sup>st</sup> General Meeting of the American Society Sugar Beet Technologists, Feb. 28 - Mar. 3, Vancouver, BC, Canada.
- Harveson, R. M., Hein, G. L., J. A. Smith, R. G. Wilson, and C. D. Yonts. 2001. Response of sugar beet cultivars to diseases in the Central High Plains. Presented at the 31<sup>st</sup> General Meeting of the American Society Sugar Beet Technologists, Feb. 28 - Mar. 3, Vancouver, BC, Canada.
- Hein, G. L., R. M. Harveson, J. A. Smith, R. G. Wilson, and C. D. Yonts. 2001. Varietal resistance to sugarbeet root aphid. Presented at the 31<sup>st</sup> General Meeting of the American Society Sugar Beet Technologists, Feb. 28 - Mar. 3, Vancouver, BC, Canada.
- Smith, J. A., C. D. Yonts, R. G. Wilson, G. L. Hein, R. M. Harveson, and K. L. Palm. 2001. Field emergence of sugarbeet varieties and relationships to laboratory germination. Presented at the 31<sup>st</sup> General Meeting of the American Society Sugar Beet Technologists, Feb. 28 - Mar. 3, Vancouver, BC, Canada.
- Yonts, C. D., J. A. Smith, R. G. Wilson, G. L. Hein, R. M. Harveson, and K. L. Palm. 2001. Regional sugarbeet variety trial. Presented at the 31<sup>st</sup> General Meeting of the American Society Sugar Beet Technologists, Feb. 28 - Mar. 3, Vancouver, BC, Canada.
- Hein, G. L. and J. A. Thomas. 2003. Impact of sugar beet root aphids on sugar beet yield and response of resistant varieties. Presented at the Joint Meeting of the International Institute for Beet Research and the American Society Sugar Beet Technologists, Feb. 26 - Mar. 1, San Antonio, TX.
- Hein, G. L., S. Blodgett, and C. D. Yonts. 2003. Field dynamics of sugar beet root aphid populations. Presented at the Joint Meeting of the International Institute for Beet Research and the American Society Sugar Beet Technologists, Feb. 26 - Mar. 1, San Antonio, TX.
- Hein, G. L. 2003. Western bean cutworm behavior in a corn/dry bean rotation in western Nebraska. Presented at the Annual Meeting of North Central Branch of Entomological Society of America, Mar. 23-26, Madison, WI.
- Siriwetwivat, B. and G. L. Hein. 2004. Survival of wheat curl mite on virus infected wheat

- plants. Presented at Annual Meeting of North Central Branch of Entomological Society of America, Mar. 28-31, Kansas City, MO.
- Krumm, J. T., T. E. Hunt, S. R. Skoda, G. L. Hein, and J. E. Foster. 2004. Population diversity and gene flow among European corn borer in the Midwestern corn belt. Presented at Annual Meeting of North Central Branch of Entomological Society of America, Mar. 28-31, Kansas City, MO.
- Catana, V., N. C. Elliott, G. E. Wilde, K. L. Giles, T. F. Peeper, G. E. Michels, G. L. Hein, D. J. Lyon. 2004. New possibilities of information technologies in plant protection. Presented at the Annual Meeting of the Entomological Society of America, No. 14-17, Salt Lake City, UT.
- Hein, G. L. and J. Thomas. 2005. Screening for varietal resistance to sugarbeet root aphid. Presented at the 33rd General Meeting of the American Society Sugar Beet Technologists, Mar. 2-5, Palm Springs, CA.
- Hein, G. L. and C. D. Yonts. 2005. Soil and moisture factors affecting sugarbeet root aphid and its impact on sugarbeet yield. Presented at the 33rd General Meeting of the American Society Sugar Beet Technologists, Mar. 2-5, Palm Springs, CA.
- Siriwetwivat, B. and G. L. Hein. 2005. Genetic variability of wheat curl mite populations. Presented at Annual Meeting of North Central Branch of Entomological Society of America, Mar. 20-23, West Lafayette, IN.
- Krumm, J. T., T. E. Hunt, S. R. Skoda, G. L. Hein, and J. E. Foster. 2005. Population structure and gene flow among European corn borer in the Midwestern United States. Presented at Annual Meeting of North Central Branch of Entomological Society of America, Mar. 20-23, West Lafayette, IN.
- Burgener, P. A. G. L. Hein, and D. J. Lyon. 2005. Agronomic and economic challenges for rain-fed crop production. Presented at the Annual Meeting of the Entomological Society of America, Dec. 15-18, Ft. Lauderdale, FL.
- Catana, V., N. C. Elliott, D. R. Porter, M. Mirik, and G. L. Hein. 2005. Towards regional aphid pest risk assessment and forecasting in wheat. Presented at the Annual Meeting of the Entomological Society of America, Dec. 15-18, Ft. Lauderdale, FL.
- Serikawa, R. H., G. L. Hein, S. R. Skoda, and J. E. Foster. 2006. Genetic variation between different populations of the sugarbeet root aphid. Presented at the Annual Meeting of the North Central Branch of the Entomological Society of America, March 26-29, Bloomington, IL.
- Harvey, S. L., G. L. Hein, and R. G. Wilson. 2006. Seasonality and impacts of *Ceutorhynchus litura* (F.) on Canada thistle. Presented at the Annual Meeting of the North Central Branch of the Entomological Society of America, March 26-29, Bloomington, IL.
- Siriwetwivat, B., G. L. Hein, R. French, and J. E. Foster. 2006. Genetic variation of field populations of wheat curl mite. Presented at the Annual Meeting of the North Central Branch of the Entomological Society of America, March 26-29, Bloomington, IL.
- Thomas, J. A. and G. L. Hein, 2006. Seasonality of the sugar bet root aphid in the western Great Plains. Presented at the Annual Meeting of the North Central Branch of the

Entomological Society of America, March 26-29, Bloomington, IL.

- Siriwetwivat, B.(presenter), G. L. Hein, and R. French, and J. Foster. 2007. Genetic variation of field populations of wheat curl mite, *Aceria tosichella* Keifer. Presented at the Annual Meeting of the North Central Branch of the Entomological Society of America, March 25-28, Winnipeg, MB.
- Hein, G. L. and J. A. Thomas (presenter). 2007. Impact of natural enemies on Russian wheat aphid populations. Presented at the Annual Meeting of the North Central Branch of the Entomological Society of America, March 25-28, Winnipeg, MB.
- Harvey, S. L. (presenter), G. L. Hein and R. W. Patrick. 2007. Efficacy of insecticide application placement and timing on army cutworm control in sugarbeet. Presented at the Annual Meeting of the North Central Branch of the Entomological Society of America, March 25-28, Winnipeg, MB.
- Hein, G. L. (presenter), R. Serikawa, J. E. Foster and J. Thomas. 2007. Variability in varietal response for resistance to sugar beet root aphid and potential implications. Presented at the 34th Meeting of the American Society of Sugar Beet Technologists, Feb. 28- March 3, Salt Lake City, UT.
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- G. Hein. 2009. Doctor of Plant Health: A new interdisciplinary program for plant health practitioners. Presented at the Entomological Society of America Annual Meeting,

Indianapolis, IN, Dec.13-16.

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- Hein, G. L., A. R. Stilwell, and D. Rundquist. 2011. Importance of vector movement on the epidemiology of a complex of mite-transmitted wheat viruses. Presented at the Joint Meeting of the American Phytopathological Society and the International Plant Protection Congress, Honolulu, HA, Aug. 6-10.
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- Pretorius, R. J., G. L. Hein, J. Bradshaw. 2014. The influence of tillage in sugar beets on beneficial, edaphic arthropod communities, and the arthropod-mediated ecosystem services they provide. Presented at the North Central Branch – Entomological Society of America, 69<sup>th</sup> Annual Meeting, Des Moines, IA. March 10, 2014.
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- McCullough, C., J. Bradshaw, and G. L. Hein. (2014) Dispersal of the wheat stem sawfly (*Cephus cinctus*). Presented at the 62<sup>nd</sup> Annual Meeting of The Entomological Society of America, Portland, OR., November 17.
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- Pretorius, R. J., J. D. Bradshaw, and G. L. Hein. (2015) The provision of ecosystem services by beneficial arthropods in agroecosystems. Presented at the 19<sup>th</sup> Annual congress of the Entomological Society of Southern Africa, Grahamstown, South Africa, July 12-17.
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- Camargo, C., B. Siegfried, T. Hunt, L. Giesler, and G. L. Hein. (2015) Residues of thiamethoxam/mefenoxam in soybean plants and potential effects non-target insects. Presented at Synergy in Science: Partnering for Solutions, 63<sup>rd</sup> Annual Meeting of the Entomological Society of America, Minneapolis, MN. November 16.
- McCullough, C., J. Bradshaw, and G. L. Hein (2015) Sampling of adult wheat stem sawfly, *Cephus cinctus* Norton, to predict larval infestation. Presented at Synergy in Science: Partnering for Solutions, 63<sup>rd</sup> Annual Meeting of the Entomological Society of America, Minneapolis, MN. November 16.
- Wosula, E., A. J. McMechan, S. Wegulo, and G. L. Hein (2015) Effect of wheat curl mite infestation and wheat streak mosaic virus inoculation timing on disease severity in winter

- wheat. Presented at Synergy in Science: Partnering for Solutions, 63<sup>rd</sup> Annual Meeting of the Entomological Society of America, Minneapolis, MN. November 17.
- Knoell, E. and G. L. Hein (2016) Determining acquisition and retention periods of *Triticum mosaic virus* by the wheat curl mite, *Aceria tosichella* Keifer. Presented at the North Central Branch meeting of the Entomological Society of America annual meeting, June 6.
- McMechan, A. J. E. Wosula, and G. L. Hein (2016) Assessing risk of over-summering hosts for wheat-mite-virus complex in winter wheat. Presented at the North Central Branch meeting of the Entomological Society of American annual meeting, June 7.
- Hein, G. L., L. Overmyer, E. Knoell, and A. J. McMechan. (2017) Field screen for identification of resistance to mite-transmitted viruses in winter wheat. Presented at ASA/CSSA/SSSA Annual Meeting, October 25.
- Knoell, E. and G.L. Hein (2017) Determining acquisition and retention periods of *Triticum mosaic virus* by the wheat curl mite. Presented at the Annual Meeting of the North Central Branch of the Entomological Society of America, Indianapolis, IN, June 5.
- Overmyer, L., E. Knoell, A. J. McMechan, and G.L. Hein (2017) Identification of resistance to mite-transmitted viruses in winter wheat through field screening. Presented at the Annual Meeting of the North Central Branch of the Entomological Society of America, Indianapolis, IN, June 5.
- Knoell, E. and G.L. Hein (2017) Field corn as a green bridge host for the wheat curl mite and its associated viruses. Presented at Entomological Society of America Annual Meeting, Denver, CO, November 6.
- Szydlo, W., G. L. Hein, and A. Skoracka (2017) Understanding the wheat curl mite complex: Genetic variation, host specificity, and ability to transmit *Wheat streak mosaic virus*. Presented at Entomological Society of America Annual Meeting, Denver, CO, November 6.
- Overmyer, L. and G.L. Hein (2018) Dispersal of wheat curl mite from virus-infected winter wheat. Presented at the 9<sup>th</sup> International Integrated Pest Management Symposium, Baltimore. MD, March.
- Knoell, E. and G.L. Hein (2018) Dynamics of wheat curl mite and its associated viruses in field corn during the green bridge. Presented at the Annual Meeting of the North Central Branch of the Entomological Society of America, Madison, WI, March 19.
- Knoell, E. and G.L. Hein (2018) Cover crop as a green bridge for wheat curl mite and wheat streak mosaic in the western Great Plains. Presented at the Annual Meeting of the North Central Branch of the Entomological Society of America, Madison, WI, March 19.
- Knoell, E. and G.L. Hein (2018) Wheat curl mite population dynamics in field corn and its relationship to kernel red streak formation. Presented at the Annual Meeting of the Entomological Society of America, Vancouver, BC, November 12.
- Overmyer, L. and G.L. Hein (2018) Dispersal of wheat curl mite from virus-infected wheat. Presented at the Annual Meeting of the Entomological Society of America, Vancouver, BC, November 12.
- Overmyer, L. and Hein, G.L. (2019) Dispersal of wheat curl mite (*Aceria tosichella* Keifer) and



virus spread within volunteer wheat. Presented at the American Society of Agronomy Meeting, San Antonio, Texas, November.

Overmyer, L. and Hein, G.L. (2019) Dispersal of Wheat Curl Mite Population Densities in Wheat Field. Presented at the North Central Branch of Entomological Society of America Annual Meeting, Cincinnati, Ohio, March.

Bergstrom, B., G. L. Hein, and J. Bradshaw. (2019) Landscape ecology of the wheat stem sawfly and its natural enemies in Nebraska. Presented at the North Central Branch of Entomological Society of America Annual Meeting, Cincinnati, Ohio, March.

Golick, D., A. J. McMechan, and G. Hein, (2019) The wheat farmer's challenge: A wheat-mite-virus management game. Presented at the Annual Meeting of the Entomological Society of America, St. Louis, November.

Thomas, B., G. Hein, and J. Bradshaw (2019) Temporal and spatial ecology of the wheat stem sawfly and its natural enemies within Nebraskan landscapes. Presented at the Annual Meeting of the Entomological Society of America, St. Louis, November.

### **Extension Publications**

I have written well over 100 extension publications of various formats (since 1988) addressing insect management and IPM topics relating to numerous field crop commodities.

### **Book Chapters – Extension**

Bradshaw, J., G. L. Hein. 2013. Insect Management. In Sugarbeet Production Guide., R. Wilson and J. Smith (Ed.), (vol. EC156). Insect Management. Status: Published

Hein, G. L., J. Michels, and P. Sloderbeck. 2010. Arthropod pests of wheat. Pp. 61-107 In: Wheat production and pest management, F. B. Peairs, Ed. Colorado State Univ. Extension, Ft. Collins, CO.

Hein, G. L. 2010. Wheat curl mite. Pp. 132-133. *In*: Compendium of wheat diseases and pests (3<sup>rd</sup> edition). W. W. Bockus, R. L. Bowden, R. M. Hunger, W. L. Morrill, T. D. Murray, and R. W. Smiley (eds). APS Press, St. Paul, 184 pp.

Hein, G. L. 2010. Mites other than wheat curl mite. Pp. 128-130. *In*: Compendium of wheat diseases and pests (3<sup>rd</sup> edition). W. W. Bockus, R. L. Bowden, R. M. Hunger, W. L. Morrill, T. D. Murray, and R. W. Smiley (eds). APS Press, St. Paul, 184 pp.

Hein, G. L., M. A. Boetel, and L. D. Godfrey. 2009. Major insect and arthropod pests. Pp. 95-117. *In*: Compendium of Beet Diseases and Pests (2<sup>nd</sup> edition). R. M. Harveson, L. E. Hanson, and G. L. Hein, eds. APS Press, St. Paul, 140 pp.

A. Gebre-Amlak, J. P. Michaud, F. B. Peairs, G. L. Hein, P. Sloderbeck, and R. A. Higgins. 2009. Insect pest management. Pp. 16-23. *In*: High Plains Sunflower Production Handbook. Publ. MF2384, Kansas State University, 42pp.

Hein, G. L. 2007. Wheat mites. Pp. 75-79. *In*: Handbook of Small Grain Insects. G. D. Buntin,

- K. S. Pike, M. J. Weiss, and J. A. Webster, eds. Entomol. Soc. Am. and Am. Phytopath. Soc. Press, St. Paul, MN.
- Hein, G. L. and F. B. Peairs. 2004. Insect Management. Pp. 93-108. *In*: H. F. Schwartz, M. A. Brick, R. M. Harveson, and G. D. Franc [eds], Dry bean production and integrated pest management (2<sup>nd</sup> edition), Dry Bean Production and Pest Diagnosis. Bulletin 562A, Colorado State Univ. Extension, Ft. Collins, 166 pp.
- Hein, G. L. 2004. Field key: insect and mite pests, abiotic damage and diseases. Pp. 145-149. *In*: H. F. Schwartz, M. A. Brick, R. M. Harveson, and G. D. Franc [eds], Dry bean production and integrated pest management (2<sup>nd</sup> edition), Dry Bean Production and Pest Diagnosis. Bulletin 562A, Colorado State Univ. Extension, Ft. Collins, 166 pp.
- Hein, G. L. and G. D. Johnson. 2001. Insect management. *In*: Sugarbeet Production Guide. University of Nebraska Cooperative Extension EC01-156. 36 pp.
- Harveson, R. M., G. L. Hein and R. G. Wilson. 2001. Scouting calendar and injury diagnostic guide. *In*: Sugarbeet Production Guide. University of Nebraska Cooperative Extension EC01-156. 5 pp.
- Hein, G. L. 1999. Wheat Curl Mite. *In*: ESA Handbook of Corn Insects. K. L. Steffey, M. E. Rice, J. All, D. A. Andow, M. E. Gray, and J. W. Van Duyn eds.. Entomological Society of America, Lanham, MD. pp. 113-114.
- Flood, Brian, Gary Hein, and Rick Weinzierl. 1995. Beans. *In*: Vegetable Insect Management, With Emphasis on the Midwest. R. Foster and B. Flood eds. Meister Pub. Co., Willoughby, OH. pp. 41-52.
- Hein, G. L., F. B. Peairs, and S. Pilcher. 1996. Dry Bean Insects. Pp. 57-65. *In*: H. F. Schwartz, M. A. Brick, D. S. Nuland, and G. D. Franc [eds], West Central-High Plains Dry Bean Production and Pest Diagnosis. Colorado State Univ. Extension, Ft. Collins, 106 pp.

### **NebGuides / NebFacts (since 2000)**

- Wegulo, S., G. L. Hein. 2013. Yellow Dwarf of Wheat, Barley, and Oats. NebGuide. Status Published.
- Weed, Ray, Ronald C. Seymour and Gary L. Hein. 2000. Sunflower head moth management. University of Nebraska Cooperative Extension, NebFact (NF00-422).
- Hein, G. L. and J. B. Campbell. 2002. A guide to grasshopper control in cropland. Univ. of Nebraska, Cooperative Extension, NF97-328 (revised May 2002).
- Campbell, J. B., P. E. Reece, G. L. Hein. 2002. A guide to grasshopper control in rangeland. Univ. of Nebraska, Cooperative Extension, NF97-329 (revised May 2002).
- Thomas, J. and G. Hein. 2002. Managing the Russian wheat aphid with resistant varieties. Univ. of Nebraska, Cooperative Extension, NF96-307 (revised Sept. 2002).
- Seymour, R. C., G. L. Hein, R. J. Wright, and J. B. Campbell. 2002. Western bean cutworm in

- corn and dry beans. Univ. of Nebraska, Cooperative Extension, G98-1359 (revised June 2002).
- Seymour, R. C. and G. L. Hein. 2002. Spring Millers. Univ. of Nebraska, Cooperative Extension, NF02-526.
- C. D. Yonts, D. J. Lyon, D. D. Baltensperger, J. M. Blumenthal, R. M. Harveson, G. L. Hein and J. A. Smith. 2002. Producing irrigated winter wheat. Univ. of Nebraska, Cooperative Extension, G02-1455.
- Hein, G. L. and J. B. Campbell. 2003. A guide to grasshopper control in yards and gardens. Univ. of Nebraska, Cooperative Extension, NF97-327. (revised May 2003)
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- Nielsen, E. L., D. D. Baltensperger, J. F. Margheim, R. C. Shearman, P. A. Burgener, J. M. Blumenthal, R. M. Harveson, G. L. Hein, R. G. Wilson, and K. P. Vogel. 2004. Irrigated production of warm-season grass seed in the High Plains. Univ. of Nebraska, Cooperative Extension, G03-1531-A.
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- Hein, G. L. and J. B. Campbell. 2006. A guide to grasshopper control in cropland. Univ. of Nebraska-Lincoln Extension, Publ. G1627. (revised July 2006)
- Hein, G. L. and J. B. Campbell. 2006. A guide to grasshopper control in yards and gardens. Univ. of Nebraska-Lincoln Extension, Publ. G1633. (revised July 2006)
- Campbell, J. B., P. E. Reece, G. L. Hein. 2006. A guide to grasshopper control in rangeland. Univ. of Nebraska Extension, Publ. G1630. (revised July 2006)
- Hein, G. L. and R. C. Seymour. 2006. Sunflower head moth management. University of Nebraska-Lincoln Extension, Publ. G1626. (revised May 2006)
- Hein, G. L., J. B. Campbell, S. D. Danielson, and J. A. Kalisch. 2006. Management of the army cutworm and pale western cutworm. Univ. of Nebraska-Lincoln Extension, Publ. G1145. (revised August 2006)
- Lyon, D., P. Burgener, R. Harveson, G. Hein, and G. Hergert. 2007. Growing safflower in Nebraska. Univ. of Nebraska-Lincoln Extension, Publ. G1702.
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<http://www.ianrpubs.unl.edu/sendIt/ec1585.html>.

### **Extension Videos / Animations**

Hein, G. L. and J. Thomas. 1996. The Russian wheat aphid. (15 minutes) Univ. of Nebraska Cooperative Extension.

Overmyer, L., S. Wegulo, C. Creech, and G. L. Hein. Surviving the green bridge (video, 5:54).  
<https://mediahub.unl.edu/media/7596>

Overmyer, L., S. Wegulo, and G. L. Hein. Symptoms of mite-transmitted viruses in wheat (video, 3:45). <https://mediahub.unl.edu/media/9730>

Overmyer, L., and G. L. Hein. Demonstration of mite/virus spread (video, 13:50).  
<https://mediahub.unl.edu/media/9784>

Overmyer, L., and G. L. Hein. Animation of mite movement and virus impact (video, 5:50).  
<https://mediahub.unl.edu/media/8858>

McMechan, A. J., and G. L. Hein. Wheat curl mite Time Machine: An interactive animation of mite movement and virus impact. <http://passel.unl.edu/custom/wheat-mite-visualization>

Overmyer, L. and E. Stine. Wheat streak mosaic diagnosis using ELISA (video, 4:55).  
<https://mediahub.unl.edu/media/10304>

### **Extension Websites:**

UNL Entomology Dept.: <http://entomology.unl.edu> - Biology and Trt. Recs. for Field Crop Pests: dry bean, sugarbeet, rangeland, sunflower, potato, and wheat insect management.

High Plains IPM Guide: <http://highplainsipm.org> - Biology and Management of Sugarbeet Insects and the Dry Beans Insects.

UNL Entomology Dept. Grasshopper Website:  
<http://entomology.unl.edu/grasshoppers/index.htm> - Established website to address need for grasshopper information.

### **Extension Circulars (since 2000)**

Wright, R., G. Hein, W. W. Hoback, and A. Pavlista. 2002. Biology and management of potato Insects. Univ. of Nebraska, Cooperative Extension, EC02-1565.

Seymour, R., J. Campbell, and G. Hein. 2003. Grasshopper identification guide for rangeland grasshoppers - fall/spring feeding species. Univ. of Nebraska, Cooperative Extension, EC03-1567.

- Seymour, R., J. Campbell, G. Hein, and J. Kalisch. 2003. Grasshopper identification guide for rangeland and pasture - summer feeding species. Univ. of Nebraska, Cooperative Extension, EC03-1568.
- Seymour, R., G. Hein, J. Campbell, and J. Kalisch. 2003. Grasshopper identification guide for cropland grasshoppers - summer feeding species. Univ. of Nebraska, Cooperative Extension, EC03-1569.
- Margheim, J. F, D. D. Baltensperger, J. T. Cecil, R. C. Sherman, D. C. Laursen, A. P. Merrigan, J. M. Krall, C. D. Yonts, R. G. Wilson, S. D. Knox, J. E. Watkins, and G. L. Hein. 2003. Kentucky bluegrass seed production. Univ. of Nebraska, Cooperative Extension, EC03-180.
- Baltensperger, D. D., D. J. Lyon, P. A. Burgener, G. L. Hein, R. M. Harveson, C. D. Yonts, J. F. Margheim, G. E. Frickel, and G. J. Foster. 2004. Brown mustard production. Univ. of Nebraska, Cooperative Extension, EC04-183a.
- Margheim, J. F, D. D. Baltensperger, R. G. Wilson, D. J. Lyon, G. L. Hein, R. M. Harveson, P. Burgener, J. M. Krall, J. T. Cecil, J. R. Rickertson, A. P. Merrigan, M. H. Watson, and B. J. Hansen. 2004. Chickpea production in the high plains. Univ. of Nebraska, Cooperative Extension, EC03-183.
- Thomas, J. A., G. L. Hein, A. D. Pavlista, and S. T. Kamble. 2004. Pesticide use on specialty crops in Nebraska - 1999. Univ. of Nebraska, Cooperative Extension, EC04-1571.
- Krall, J. M., S. D. Miller, J. T. Cecil, C. Bastian, T. Foulke, D. D. Baltensperger, R. M. Harveson, P. A. Burgener, G. W. Hergert, G. L. Hein, D. J. Lyon, T. Nleya, J. Rickertsen, and S. Blodgett. 2006. Pea production in the High Plains. University of Nebraska-Lincoln Extension, Publ. EC187.
- Smith, J. A., R. G. Wilson, C. D. Yonts, G. L. Hein, R. M. Harveson, and G. W. Hergert. 2006. Chicory Production Guide. University of Nebraska-Lincoln Extension, Publ. EC 161.
- Wegulo, S. N., Hein, G. L., Klein, R. N., and French, R. C. 2008. Managing Wheat Streak Mosaic. University of Nebraska-Lincoln Extension, Publ. EC1871.
- Paula-Moraes, S., W. Ohnesorg, E. Burkness, G. L. Hein, T. E. Hunt, R. J. Wright, W. D. Hutchison. 2012. Western Bean Cutworm Speed Scouting Spreadsheets. University of Nebraska-Lincoln Extension Circular EC1585  
<http://www.ianrpubs.unl.edu/sendIt/ec1585.html>.

### **Presentations - Extension (Nebraska)**

Since 1988, I have prepared and presented ca. 500 extension presentations and demonstrations at workshops, clinics, field days and other extension activities in Nebraska.

### **Invited Presentations (Regional / National Level) - Extension (since 2000)**

Hein, G. L. 2000. Troubleshooting your crop. Presented at the Colorado State Univ. Pest Management Clinic. Jan. 4-6, Ft. Collins, CO.

- Hein, G. L. 2003. Sugarbeet insect pests. Presented at Montana State Univ. Sugarbeet Symposium, Jan. 13-14, Billings, MT.
- Hein, G. L. 2003. Management corn insect pests. Presented at Montana State Univ. Sugarbeet Symposium, Jan. 13-14, Billings, MT.
- Hein, G. L. 2004. Western bean cutworm: Expanding its range to Minnesota? Presented at the 24<sup>th</sup> Annual Crop Pest Management Short Course, Nov. 22-23, University of Minnesota, St. Paul, MN.
- Hein, G. L. 2005. Insect and arthropod pests of sugarbeet. Presented at Colorado State Univ. Troubleshooting corn, beans, and beets workshop. Jan. 5-6, Sterling, CO.
- Hein, G. L. 2005. Managing sugarbeet insect pests. Presented at Montana State Univ. Sugarbeet Symposium, Jan. 10-11, Billings, MT.
- Hein, G. L. 2005. Managing insect problems in dry beans. Presented at Montana State Univ. Sugarbeet Symposium, Jan. 10-11, Billings, MT.
- Hein, G. L., F. Peairs, J. Campbell, M. Brewer, S. Blodgett, W. Lanier, W. Cranshaw, and H. Schwartz. 2006. Evolution of the High Plains Integrated Pest Management Guide and workgroup. Presented at the 5<sup>th</sup> National Integrated Pest Management Symposium, April 4-6, St. Louis, MO.
- Hein, G. L. 2006. Western bean cutworm: New corn belt threat? Presented to the 2006 Corn Media Summit (Dow Agrosiences), August 10, Indianapolis, IN.
- Hein, G. L. 2007. History and Biology of the Western Bean Cutworm. Presented at the Western Bean Cutworm Short Course sponsored by Univ. of Illinois Extension and the North Central IPM Center, Feb. 28.

## **Organizational citizenship**

### **NATIONAL**

- ◆ Entomological Society of America
  - ESA 62<sup>nd</sup> Annual Meeting, Symposium Organizer: Entomology – A Foundational Discipline for Integrated Plant Health Training, (2014)
  - North Central Branch
    - Resolutions Committee, 1995
    - Program Chair for 1996
    - Award of Merit Committee, Chair, 2004
    - President elect (2005-06); President (2006-07)
    - Audit Committee (2012-2012); Chair 2012
    - NCB Photo Salon Committee (2007 – present)
    - Nomination Committee (2013-2015)
    - Symposium Co-Organizer (2013)
  - Judge for 10 minute paper competition
  - Section F (Crop/Urban Pest Man.)
    - 1999 Section F Chairman, ESA Annual Meeting Program Committee
    - 1998 Section F Chair-elect, Chair Section F Program Committee
    - 1997 Section F Secretary
  - Resolutions Chair - 2003, 2007
  - Journal of Economic Entomology Editorial Board (Section F rep; 2003-2008)
  
- ◆ Technical Editor (2005-12), Crop Management, (an online peer-reviewed journal of applied crop science) Plant Management Network, Crop Science Society of America.
  
- ◆ Reviewed manuscripts for the following journals (over the past 5 years):
  - Journal of Economic Entomology
  - Environmental Entomology
  - Agronomy Journal
  - Journal of Production Agriculture
  - Journal of Entomological Science
  - Journal of Kansas Entomological Society
  - Phytopathology

### **ENTOMOLOGY DEPARTMENT**

- ◆ Promotion and Tenure Committee (2001-2009); Chair-2003, 2006, 2009