

## **Summary of Program Activity at NCSU.**

**1. Extension and Engagement with Constituencies outside the University:** Our program is consistent with the “One Mission-One Vision-One Extension” goal to “Ensure a profitable and economically and environmentally sustainable agriculture sector, including food”. We have emphasized Extension Training, particularly agent training. We have organized or participated in 64 Field Faculty training events. Several events we organized included 2-day intensive workshops that had high training impact and superior feedback. We also have (Co-) or organized 13 field days with a direct beneficial impact on agent training. In support of agent local services, we have diagnosed 4273 samples of strawberry, tomato or pepper that have been submitted to the clinic. Timely and accurate diagnosis is important for economical disease management and to enhance credibility of local extension services.

Extension information is delivered through Extension Bulletins, articles in industry and extension newsletters, and electronic alerts/pest news articles generating a consistent output of 22.5 articles per year for a cumulative total of 285 extension publications. We have built a comprehensive program recognized for useful information and we are able to communicate results well to agents, growers and other primary clientele. This has lead to recurrent research-based invitations (total =55) to present our information including at most of the major Fruit and Vegetable Conventions in eastern North America (Ontario, Canada, PA, OH, NJ, NC, SC, and GA). We typically deliver a product at these conventions that growers can take home to implement integrated disease and sustainable agriculture management practices. Although not as distinguished as major conventions and other invitations, we also give an average over 20 talks per year, for a cumulative total of about 350 talks, in support of local program development, teaching and engagement programs. In all cases, we emphasize integrated disease management practices and practices consistent with a sustainable agriculture.

Our recommendations are research based and have broad regional impact. For example, our strawberry disease management recommendations are used throughout most of the Southeast (excluding Florida) and are relied on in northern production regions especially where plasticulture systems are used. See <http://www.smallfruits.org/SmallFruitsRegGuide/Guides/2009/2009StrawberryIMGFinalNov17.pdf>. Likewise, our methyl bromide work has received considerable national and international recognition mitigating the loss of \$14 million per year for growers in the SE-USA with emphasis not solely focused on fumigant alternatives but also management practices consistent with a sustainable agriculture. Outcomes include information and support for local, regional, national and international clientele and decision makers. We emphasize applied research and communication of those results.

**2. Discovery of Knowledge (Scholarship Area):** The extension program is primarily fed through an aggressive applied research program. We have generated over 2 Peer Reviewed publications per year on average. Louws publications have a high ISI Citation Index with 883 citations, an average of 29.4 citations per item and an h-Index of 12. Our applied research is also published through a steady stream of proceedings at national and international meetings with an average output of 3.3 proceedings per year and 5 abstracts per year at major professional meetings. This is complemented by regular publications of peer reviewed technical reports (4 per

year). The cumulative output is 29 peer-reviewed articles, 2 research review articles, 38 proceedings, 5 invited book chapters, 52 refereed technical reports, and 66 research abstracts since 1996.

**3. Teaching and Mentoring of Undergraduate and Graduate Students:** We also have a high commitment to teaching. Over the last 10 years our team comprised 13-14 people/year within our lab group, all on soft money except our technician team member (now on 60% state funds). We structure the program to endure a high level of opportunity for all students – from undergrads to postdocs. We have had excellent students and postdocs, and most have excelled in subsequent jobs in Industry or extension. One of our former postdocs is now a faculty member at Iowa State University. Most of those working for us have become heavily engaged in the extension component of our program – although their work was primarily research based. Finally, Louws provides the lead but team members have enjoyed teaching PP502- a core course in the plant pathology curriculum and focused on Methods and Diagnosis of plant disease. Average ratings have been 4.38 to 4.74 (out of 5) over 4 years with high scores of 5.0 for “The instructor was enthusiastic about teaching the course” and low scores of 4.0 for “Lab facilities, equipment, supplies, etc. were adequate”.

**4. Service in Professional Societies and Service and Engagement within the University**  
**Itself:** We are active in the department and also in serving in professional societies; being committed to assist where our capabilities lie and according to the strength of our program.

In summary, we have been able to develop a comprehensive and integrated Extension, Research and Teaching program with particular focus on key commodity crops important to North Carolina Agriculture and have advanced fundamental concepts in plant pathology and sustainable agriculture. We owe considerable thanks to our former team members, students, colleagues, NC-growers, NC- extension team and NCSU administration.