

**Dr. Madhu Khanna, University of Illinois, Department of Agricultural and Consumer Economics:**

Review of the 8-30-07 Draft Science Advisory Board Hypoxia Advisory Panel Report

I am very impressed by the quality of the report prepared by the committee. The report is comprehensive, up to date in terms of incorporating the latest scientific findings and balanced in terms of its recommendations. My comments are limited to some of the sections that I felt qualified to review, such as those addressing cost-effectiveness and environmental implications of alternative approaches for pollution control and the effectiveness of existing policies in inducing environmentally friendly changes (Sections 4.4 and 4.5). I have a few comments that the committee might consider for inclusion in the report for completeness.

- a) In Section 4.4.2 it might be useful to have some discussion on the effectiveness of land retirement programs vs. working land programs for conservation. While the CRP has been and continues to be the largest conservation program in terms of acreage and funding, there is an increasing emphasis on working land programs such as the Conservation Security Program. The CRP uses an Environmental Benefits Index that aims to target enrollment towards areas with high environmental benefits and lower costs and compensates farmers to retire their land from crop production. In contrast, the CSP pays farmers for ongoing stewardship practices rather than just for newly adopted practices. This raises issues of additional benefits achieved. Mechanisms used for targeting CSP enrollment are not as clearly defined and there is no emphasis on competitive bidding for enrollment in these working land programs.
- b) The work of CEAP which is seeking to provide nation-wide estimates of benefits of conservation programs should provide valuable findings. However, it needs to be supplemented with economic analysis at a similar scale to determine the costs of alternative conservation practices and help identify where conservation programs should be targeted to have the maximum impact on the hypoxic zone. I am not sure to what extent that is currently happening.
- c) As pointed out in Section 4.4.4 existing crop subsidies create counter incentives to conservation. It might also be worth emphasizing the point made in lines 38-41 that replacing crop subsidies by subsidies that reward environmentally friendly actions could lead to a double dividend in terms of improved environmental outcomes and increased social welfare (because they reduce the need for distortionary income and commodity taxes to finance the crop subsidies). I am attaching a paper under second submission to the *American Journal of Agricultural Economics*, which uses a stylized general equilibrium model to show the magnitude of the welfare gains possible even with the fairly large reductions in nitrogen use/loadings (40-50%) suggested by this panel report as needed to contain the hypoxic zone.

- d) Page 190, lines 16-26. It might be mentioned here that some of the reasons for low rates of adoption of precision technologies has been the high fixed costs of adoption and uncertainties of crop prices and yields. Farmers are therefore likely to have high option values for investing in such technologies. Moreover, the economic returns from adoption are likely to vary spatially depending on the heterogeneity in soil conditions. Thus cost-share subsidies may need to be high enough to cover option values and vary spatially to create sufficient incentives for adoption. Such subsidies may also need to be supplemented by revenue insurance programs to overcome the risks of adoption. Please see the following papers for more discussion of these issues:

Khanna, M., M. Isik, and A. Winter-Nelson, "Investment in Site-Specific Crop Management under Uncertainty: Implications for Nitrate Pollution Control and Environmental Policy," *Agricultural Economics*, 24 (1): 9-21, December 2000.

Khanna, M., "Sequential Adoption of Site-Specific Technologies and its Implications for Nitrogen Productivity: A Double Selectivity Model," *American Journal of Agricultural Economics*, 83: 35-51, February 2001.

Isik, M. and M. Khanna, "Variable Rate Nitrogen Application under Uncertainty: Implications for Profitability and Nitrogen Use," *Journal of Agricultural and Resource Economics*, 27 (1): 61-76, July 2002.

Isik, M. and M. Khanna, "Stochastic Technology, Risk Preferences and Adoption of Site-specific Technologies," *American Journal of Agricultural Economics*, 85 (2): 305-317, May 2003.