Potential check-off benefits to farmers in the presence of wind-borne diseases

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In the event of wind-borne disease outbreaks, farmers have traditionally purchased insurance plans that issue indemnity payments upon infection. This paper highlights a possible alternative to standard programs by assessing potential benefits to infected area farmers through a check-off program. A simulation is conducted assuming three outbreak scenarios using Asian soybean rust (ASR) as a case and data collected by a USDA soybean rust tracking system. Results revealed that at 33.2, 39.4, and 59.3% probabilities of spread, the benefits to soybean producers after infestation are greater than the standard policy under the spread scenarios with $160.95, $221.31, and $527.21 million.

Key words: Wind-borne disease, soybean rust, indemnity payments, check-off.

INTRODUCTION

Asian soybean rust (ASR) is a harmful windborne fungal disease caused by either of two fungal species, *Phakopsorapachyrhizi* or *Phakopsora meibomiae*, with the latter species being less aggressive. Hurricane Ivan, which made contact with the US in September, 2004 is believed to have carried spores of ASR from infected fields in Colombia. Later that year, ASR was discovered in Louisiana in November, 2004 and had been found in eight additional states, primarily in the southern region within the span of three weeks (Fraisse et al., 2009). Much effort has been expended to prevent the spread of such diseases by prevention, scouting, and monitoring. In an effort to assist farmers with preventative measures, the state of Iowa formed a ‘Rust Fast Track System’ after identifying ASR as a major threat to its economy by potentially jeopardizing 10 million acres of soybeans (Robertson and Tylka, 2007). Other states such as Alabama also joined with monitoring efforts. The Alabama Cooperative Extension Field Crops Team developed an innovative monitoring method which combined standard extension methods with a statewide disease monitoring system and a national Web-based information network. It was estimated that Alabama soybean producers saved over $2.5 million in costs (Sikora et al., 2009). The objective of this article is to highlight the potential check-off benefits to farmers in the presence of wind-borne

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to farmers in the presence of wind-borne diseases as discussed by Bekkerman et al. (2011).

Bekkerman et al. (2011) proposed an alternative policy to purchasing an insurance plan in the event of any yield lost due to a wind-borne disease. The researchers proposed a check-off program, which collects a small percentage of revenues and transfers into a fund. Once a disease has been detected, any producer within the infected area may withdraw from the fund in the form of payment for any preventative measures taken in the presence of the wind-borne disease. The fund may also be used as a monetary reserve for future disease spreads, a support for tracking systems, and an assistance for local prevention.

The authors simulated welfare effects associated with this proposed policy using Equilibrium Displacement Modeling (EDM) applied to the U.S. soybean industry complex. EDM employs comparative statics with the objective of assessing the impact of changes in exogenous variables on endogenous variables measured in proportional terms. The 2007 to 2008 baseline values for the total amount of soybeans produced and the price per bushel in the U.S. were 2,585 million bushels and a farm price of $10.15 per bushel, respectively. After determining actuarially-fair premium rates, the national check-off rate was calculated by weighing county-level rates by each county’s production level, which resulted as 0.7% for 2008. The simulated effects after instituting the check-off program were as follow: (1) the market price received by producers increased by $0.000711/bushel, (2) quantities supplied deceased slightly by 0.09%, and (3) revenues were sufficient for payment distribution to farmers. Overall, the check-off program would provide adequate funds for infected areas with minimal effects to the U.S. soybean market.

In the case of an ASR outbreak, the authors compared the standard indemnification program with the check-off program under various probabilities of occurrence. A supply decrease under the standard indemnification program fell 1.35, 1.45, and 1.89 times greater than the mitigation program at 33.2, 39.4, and 59.3% probabilities of soybean rust spread, respectively. Producer surplus (the benefits to producers in the market) before infestation is greater under the standard indemnification program, which is to be expected. However, after the infestation occurs, producer surplus is $160.95 million, $221.31 million, and $527.21 million greater than the standard policy under the three spread scenarios.

The simulation results from the study indicated that under a check-off policy, the U.S. soybean industry may be able to avoid welfare losses that range between $604 million (18.42% assumed spread probability) and $1.7 billion (59.3% assumed probability). We believe that with knowledge of not only costs of mitigation and treatment, but also direct benefits to farmers can result in long run prevention strategies for an entire invaded area.

**Conflict of Interest**

The authors have not declared any conflict of interest.

**REFERENCES**


