

sheets for employees of the grain storage facility who performed activities connected to the decontamination, and any other documentation that helps show the cost to the owner and that decontamination has been completed. Claims for compensation must be received by APHIS on or before May 31, 1997. The Administrator may extend this deadline, upon request in specific cases, when unusual and unforeseen circumstances occur which prevent or hinder a claimant from requesting compensation on or before May 31, 1997.

(e) *Flour millers.* Flour millers who, in accordance with a compliance agreement with APHIS, heat-treat millfeed made from wheat produced in regulated areas that require such treatment are eligible to be compensated at the rate of \$35.00 per short ton of millfeed. The amount of millfeed compensated will be calculated by multiplying the weight of wheat from the regulated area received by the miller by 25 percent (the average percent of millfeed derived from a short ton of grain). Compensation payments will be issued by APHIS. To claim compensation, the miller must submit to an inspector verification as to the actual (not estimated) weight of the wheat (such as a copy of the limited permit under which the wheat was moved to the mill or a copy of the bill of lading for the wheat, if the actual weight appears on those documents, or other verification). Flour millers must also submit verification that the millfeed was heat treated (such as a copy of the limited permit under which the wheat was moved to a treatment facility and a copy of the bill of lading accompanying that movement; or a copy of PPQ Form 700 (which includes certification of processing) signed by the inspector who monitors the mill). Claims for compensation must be received by APHIS on or before May 31, 1997. The Administrator may extend this deadline, upon request in specific cases, when unusual and unforeseen circumstances occur which prevent or hinder a claimant from requesting compensation on or before May 31, 1997.

(f) *National Karnal Bunt Survey participants.* If a grain storage facility participating in the National Karnal Bunt Survey tests positive for Karnal bunt spores, the facility will be regulated and may be ordered decontaminated pursuant to an Emergency Action Notification (PPQ Form 523) issued by an inspector. If a Declaration of Extraordinary Emergency has been declared for the State in which the grain storage facility is located, the

owner of the grain storage facility will be eligible for compensation as follows:

(1) *Loss in value of positive wheat.* The owner of the grain storage facility will be compensated for the loss in value of positive wheat. Compensation will equal the estimated market price for the relevant class of wheat minus the salvage value, as described in paragraph (b)(3) of this section. The estimated market price will be calculated by APHIS for each class of wheat, taking into account the prices offered by relevant terminal markets (animal feed, milling, or export) for the period between October 1 and November 30, 1996, with adjustments for transportation and other handling costs. However, compensation will not exceed \$2.50 per bushel under any circumstances. Compensation payments for loss in value of wheat will be issued by the Farm Service Agency (FSA). To claim compensation, the owner of the facility must submit to the local FSA office a copy of the Emergency Action Notification under which the facility is or was quarantined and verification as to the actual (not estimated) weight of the wheat (such as a copy of the limited permit under which the wheat was moved to a mill or a copy of the bill of lading for the wheat, if the actual weight appears on those documents, or other verification). Claims for compensation must be received by FSA on or before May 31, 1997. The Administrator may extend this deadline, upon request in specific cases, when unusual and unforeseen circumstances occur which prevent or hinder a claimant from requesting compensation on or before May 31, 1997.

(2) *Decontamination of grain storage facilities.* The owner of the facility will be compensated on a one time only basis for each grain storage facility and each covered crop year wheat for the direct costs of decontamination of the facility at the same rate described under paragraph (d) of this section (up to 50 percent of the direct costs of decontamination, not to exceed \$20,000 per grain storage facility). Compensation payments for decontamination of grain storage facilities will be issued by APHIS, and claims for compensation must be submitted in accordance with the provisions in paragraph (d) of this section. Claims for compensation must be received by APHIS on or before May 31, 1997. The Administrator may extend this deadline, upon request in specific cases, when unusual and unforeseen circumstances occur which prevent or hinder a claimant from requesting compensation on or before May 31, 1997.

Done in Washington, DC, this 30th day of April 1997.

Donald W. Luchsinger,

Acting Administrator, Animal and Plant Health Inspection Service.

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DEPARTMENT OF AGRICULTURE

Animal and Plant Health Inspection Service

7 CFR Part 301

[Docket No. 96-016-20]

RIN 0579-AA83

Karnal Bunt Regulatory Flexibility Analysis and Regulatory Impact Analysis

AGENCY: Animal and Plant Health Inspection Service, USDA.

ACTION: Final rule; regulatory flexibility analysis and regulatory impact analysis.

SUMMARY: We are publishing in this document the regulatory flexibility analysis prepared for a final rule, which is published elsewhere in this issue of the **Federal Register**, that adopts, with changes, an interim rule that provided compensation for certain growers and handlers, owners of grain storage facilities, and flour millers in order to mitigate losses and expenses incurred because of Karnal bunt in the 1995-1996 crop season. The final rule also adds compensation provisions for handlers of wheat that was tested and found negative for Karnal bunt, for handlers and growers with wheat inventories for past crop seasons, and for participants in the National Karnal Bunt Survey whose wheat or grain storage facility is found positive for Karnal bunt. We are also publishing in this document a regulatory impact analysis for the interim rules and final rules that established the Karnal bunt quarantine, regulations, and compensation provisions, including a final rule on compensation published elsewhere in this issue of the **Federal Register**.

FOR FURTHER INFORMATION CONTACT: Mr. Mike Stefan, Operations Officer, Domestic and Emergency Operations, PPQ, APHIS, 4700 River Road Unit 134, Riverdale, MD 20737-1236, (301) 734-8247.

SUPPLEMENTARY INFORMATION: Karnal bunt is a fungal disease of wheat (*Triticum aestivum*), durum wheat (*Triticum durum*), and triticale (*Triticum aestivum* X *Secale cereale*), a hybrid of wheat and rye. Karnal bunt is

caused by the smut fungus *Tilletia indica* (Mitra) Mundkur and is spread by spores. The establishment of Karnal bunt in the United States would have significant consequences with regard to the export of wheat to international markets. The regulations regarding Karnal bunt are set forth in 7 CFR 301.89-1 through 301.89-14.

On October 4, 1996, we published in the **Federal Register** (61 FR 52189-52213, Docket No. 96-016-14) a final rule that amended a series of interim rules establishing a program to control and eradicate Karnal bunt in the United States, and also made final a proposed rule establishing criteria for levels of risk for areas with regard to Karnal bunt and criteria for seed planting and movement of regulated articles based on those risk levels. Elsewhere in this issue of the **Federal Register** we are publishing a companion docket (Docket No. 96-016-17) to this document, in order to adopt as a final rule, with changes, an interim rule that amended the Karnal bunt regulations to provide compensation for certain growers and handlers, owners of grain storage facilities, and flour millers in order to mitigate losses and expenses incurred because of Karnal bunt in the 1995-1996 crop season. Additionally, the final rule adds compensation provisions for handlers of wheat that was tested and found negative¹ for Karnal bunt, for handlers and growers with wheat inventories for past crop seasons, and for participants in the National Karnal Bunt Survey whose wheat or grain storage facility is found positive¹ for Karnal bunt.

On April 3, 1997, we published in the **Federal Register** a regulatory flexibility analysis (62 FR 15809-15819, Docket No. 96-016-18) for the interim rules and the October 4, 1996, final rule that established the Karnal bunt quarantine and regulations. In this document, we are publishing a Final Regulatory Flexibility Analysis for Docket No. 96-016-17. Additionally, in this document, we are publishing a Regulatory Impact Analysis that analyzes the costs and benefits of the Karnal bunt interim rules and final rule we have already

¹ Throughout this document, in discussing tests for Karnal bunt, "found negative" means that no Karnal bunt spores were found, and "found positive" means that Karnal bunt spores were found. This applies whether the tests involved were of propagative wheat or nonpropagative wheat, in fields, conveyances, or grain storage facilities.

On May 1, 1997, we published an interim rule in the **Federal Register** (Docket No. 96-016-19, 62 FR 23620-23628) that established a new standard for defining regulated areas for Karnal bunt based on finding bunted wheat kernels rather than just spores. That change does not affect any of the activities analyzed in this document.

published, as well as those of the provisions in Docket No. 96-016-17.

- I. Introduction
- II. Need for Regulation
- III. Benefits of the Federal Quarantine Program
- IV. Impact on the Affected Industry of Karnal Bunt and Regulatory Actions
- V. Federal Compensation to Mitigate Losses
- VI. Conditions for Wheat Production and Utilization in a Regulated Area for the 1996-97 Crop Year
- VII. Consideration of Alternatives to the Rule
- VIII. Regulatory Flexibility Analysis—Impacts on Small Entities Within the Regulated Area
- IX. Summary and Conclusions

I. Introduction

In accordance with Executive Order 12866, this analysis examines the economic impacts, including costs and benefits of the Karnal bunt regulations published to date, including Docket No. 96-016-17. Additionally, in accordance with the Regulatory Flexibility Act (5 U.S.C. 601 *et seq.*), we have conducted an analysis of the economic impact, costs, and benefits the provisions of Docket No. 96-016-17 will have on small entities. That analysis is set forth below under the heading "VIII. Regulatory Flexibility Analysis—Impacts on Small Entities Within the Regulated Area."

On March 8, 1996, Karnal bunt was detected in Arizona during a seed certification inspection done by the Arizona Department of Agriculture. On March 20, 1996, the Secretary of Agriculture signed a "Declaration of Extraordinary Emergency" authorizing the Secretary to take emergency action under 7 U.S.C. 150dd with regard to Karnal bunt within the States of Arizona, New Mexico, and Texas. In an interim rule effective on March 25, 1996, and published in the **Federal Register** on March 28, 1996 (61 FR 13649-13655, Docket No. 96-016-3), the Animal and Plant Health Inspection Service (APHIS) established the Karnal bunt regulations (7 CFR 301.89-1 through 301.89-11), and quarantined all of Arizona and portions of New Mexico and Texas because of Karnal bunt. The regulations define regulated articles and restrict the movement of these regulated articles from the quarantined areas.

After the regulations were established, Karnal bunt was detected in seed lots that were either planted or stored in California. On April 12, 1996, the Secretary of Agriculture signed a "Declaration of Extraordinary Emergency" authorizing the Secretary to take emergency action under 7 U.S.C. 150dd with regard to Karnal bunt within California. In an interim rule effective on April 19, 1996, and published in the

Federal Register on April 25, 1996, APHIS also regulated portions of California because of Karnal bunt (61 FR 18233-18235, Docket No. 96-016-5). In an interim rule effective on June 27, 1996, and published in the **Federal Register** on July 5, 1996 (61 FR 35107-35109, Docket No. 96-016-6), we removed certain areas in Arizona, New Mexico, and Texas from the list of areas regulated because of Karnal bunt. That list was amended in a technical amendment effective on July 9, 1996, and published in the **Federal Register** on July 15, 1996 (61 FR 36812-36813, Docket No. 96-016-8). In an interim rule effective June 27, 1996, and published in the **Federal Register** on July 5, 1996 (61 FR 35102-35107, Docket No. 96-016-7), we amended the regulations to provide compensation for certain growers and handlers, owners of grain storage facilities, and flour millers in order to mitigate losses and expenses incurred because of actions taken by the Secretary to prevent the spread of Karnal bunt.

In a proposed rule published in the **Federal Register** on August 2, 1996 (61 FR 40354-40361, Docket No. 96-016-10), we proposed to amend the regulations to establish criteria for levels of risk for areas with regard to Karnal bunt and for the movement of regulated articles based on those risk levels, and to establish criteria for seed planting. A rule finalizing these provisions was published in the **Federal Register** on October 4, 1996 (61 FR 52189-52213, Docket No. 96-016-14). In Docket No. 96-106-17, published elsewhere in this issue of the **Federal Register**, we make final the interim rule on compensation published in the **Federal Register** on July 5, 1996, and establish compensation provisions for handlers of wheat that was tested and found negative for Karnal bunt, for handlers and growers with wheat inventories for past crop seasons, and for participants in the National Karnal Bunt Survey whose wheat or grain storage facility is found positive for Karnal bunt.

II. Need for Regulation

Karnal bunt is a fungal disease of wheat (*Triticum aestivum*), durum wheat (*Triticum durum*), and triticale (*Triticum aestivum* X *Secale cereale*). Upon detection of Karnal bunt in Arizona, the imposition of Federal quarantine and emergency actions was a necessary, short-run, measure taken to prevent the interstate spread of the disease to other wheat producing areas in the country. The intent of the quarantine was to immediately contain the disease in the outbreak area, so that eradication could be eventually

achieved. In dealing with a new disease outbreak, eradication is a reasonable first objective as long as national disease-prevalence data indicate that eradication remains a viable option. The establishment of Karnal bunt in the United States would have significant economic ramifications on the U.S. wheat export market, given that approximately 50 percent of exports are to countries that maintain restrictions against wheat imports from countries where Karnal bunt is known to occur. The benefits of the regulatory program can thus be viewed as the avoidance of potential losses to the wheat export market in the absence of regulation. The economic significance of the wheat industry required swift and coordinated action, which in this case was most efficiently achieved under Federal coordination.

Wheat intended for domestic processing and export is often blended at elevators to establish lots of uniform quality. Except for those occasions where a specific producer's wheat is processed separately under contract to a miller, the elevator's supply of wheat usually consists of a mix of many varieties from many producers and areas. For this reason, Federal oversight is needed to safeguard against cross-contamination and to instill confidence from both domestic and foreign buyers. Thus, it is conceivable that, without Federal intervention, individual States and importing countries would place their own, perhaps more severe, restrictions on wheat shipments.

As additional information from sampling and testing became available in subsequent months following the outbreak, the Agency was able to ease the quarantine in order to minimize disruption to affected entities. Those changes, which were detailed in the October 4, 1996, final rule, established various risk categories for wheat planting for the 1996-97 crop, relieving unnecessary restrictions as the

regulatory actions that are imposed on each category are based on the level of risk.

Subsequent sections of this analysis are structured as follows: Section III addresses the benefits of regulation to provide a perspective against which the regulatory policies were formed. Section IV addresses the impact on the affected industry of the disease and subsequent quarantine actions. Section V analyzes compensation the Agency expects to pay to partially mitigate losses caused by Agency actions. Section VI provides a projection of the impact in the regulated areas based on risk categories for wheat planting in 1996-97. Other alternatives to the rule are discussed in section VII. The wheat industry within the regulated area is composed largely of small entities that can be classified as small according to definitions established by the Small Business Administration (SBA). Thus, the impacts discussed throughout this analysis are directly applicable to small entities. As required by the Regulatory Flexibility Act, the characteristics of and impacts on small entities within the regulated areas are examined in section VIII. A summary of the analysis is provided in section IX.

III. Benefits of the Federal Quarantine Program

The disease Karnal bunt causes production losses to wheat in the form of yield reduction due to the infestation of kernels, and reduction in the quality of grain. Roughly 4 percent of wheat fields in Arizona, and 0.04 and 14 percent of fields in Imperial and Riverside counties in California, respectively, were found to be infected with Karnal bunt.

The most economically significant impact of the disease, however, is inarguably its effect on the export market. This is because about half of U.S. wheat exports are to countries that maintain restrictions against wheat

imports from countries where Karnal bunt is known to occur.² Eliminating the quarantine currently in place would jeopardize trade with those countries. Benefits of Federal quarantine, therefore, can be regarded largely as the avoided losses to the export market.

A 50-percent reduction in U.S. wheat exports would likely reduce U.S. wheat prices by 30 percent, and lower net sector income by \$2.7 billion. This estimate takes into account the dampening effect on domestic wheat prices, as wheat for export is diverted into the domestic consumption market, animal feed outlets, and ending stocks.

The reduction in U.S. wheat exports, however, would likely be less than 50 percent. First, not all countries that have restrictions against Karnal bunt would, in practice, strictly prohibit wheat imports from the United States. (Italy and Germany currently import wheat from countries where Karnal bunt is known to occur despite European Union regulations to the contrary). Second, while some markets would be captured by exports from countries that are free of Karnal bunt, U.S. wheat exports to countries that have no restrictions against Karnal bunt would likely increase. Lastly, substitution across domestic markets could provide added flexibility in meeting export demands. In the long run, the effects could be minimal depending on whether the market were to treat Karnal bunt as a quality issue and develop discounts for Karnal bunt.

It is estimated that the impact of Karnal bunt on exports, because of substitution effects, would likely result in a 10-percent reduction in U.S. wheat exports. A decrease of 10-percent in exports would cause a 22-cent per bushel drop in the wheat prices and a drop in wheat sector income of over \$500 million. The effects of decreases in wheat exports of various percentages are presented in Table 1.

TABLE 1.—EFFECT OF A DECREASE IN WHEAT EXPORTS DUE TO KARNAL BUNT, 1997/98 CROP YEAR

Item	Unit	Reduction in exports			
		0%	10%	25%	50%
Exports	mil. bu.	1,200	1,080	900	600
Total use	mil. bu.	2,462	2,394	2,295	2,138
Price	\$/bu	3.85	3.63	3.29	2.68
Value of production	mil. dol.	9,543	8,898	8,146	6,637
Gross income ¹	mil. dol.	11,358	10,813	9,961	8,580
Variable expenses	mil. dol.	4,823,823	4,823	4,823	
Net income	mil. dol.	6,536	5,990	5,138	3,758

¹ Includes market transition payments.

² About 1.2 billion bushels of wheat are exported from the U.S. annually, at a value of \$4 billion.

The 1996 Federal quarantine and emergency actions served to contain Karnal bunt in the initial outbreak area of the Southwest United States. The Federal program provided assurances to wheat importing countries that wheat from uninfected areas were monitored for Karnal bunt under the National Survey program, by sampling and testing of all wheat fields in the United States. Countries that are willing to accept wheat from the affected areas are also assured that grain originating from those areas are tested negative twice for the disease. Through these means, the Federal Karnal bunt program served to maintain and preserve the economic viability of the U.S. wheat export.

IV. Impact on the Affected Industry of Karnal Bunt and Regulatory Actions

The wheat industry within the regulated area is largely composed of businesses who can be considered as "small" according to guidelines established by the Small Business Administration (SBA). The characteristics of these firms as well as other small affected entities are provided in detail in section VIII, the Regulatory Flexibility analysis of impacts on small entities. The following discussion on impacts is directly applicable to these entities.

The 1995-96 Karnal bunt regulations primarily affect persons or entities that produce wheat in a regulated area and/or move certain articles associated with wheat out of a regulated area. These articles are subject to certain regulatory actions to minimize the risk of spreading the causal agent of the disease to other uninfected areas. Regulated articles include:

1. Farm machinery and equipment used to produce wheat;
2. Conveyances from field to handler, such as farm trucks and wagons;
3. Grain elevators, equipment and structures at facilities that store and handle grain;
4. Conveyances from handler to other marketing channels, such as railroad cars;
5. Plant and plant parts, such as grain for milling, grain for seed, and straw;
6. Flour and milling byproducts;
7. Manure from animals fed wheat/wheat byproducts from quarantine area;
8. Used sacks;
9. Seed-conditioning equipment;
10. Byproducts of seed cleaning;
11. Soil-moving equipment;
12. Root crops with soil;
13. Soil.

As part of the Karnal bunt program, grain that tests positive for Karnal bunt is prohibited from moving out of the

regulated areas. Other contaminated articles must be cleaned and sanitized before such movement. Millfeed must be treated to render inactive any disease causal agent before its addition into animal feed. Grain that tests negative may move under limited permit to approved mills. Commercial seed intended for planting is prohibited movement outside the regulated areas. Wheat seed to be planted within the regulated areas must be sampled and tested for Karnal bunt, and, for seed originating in a regulated area, treated prior to planting. Wheat growers in New Mexico and Texas whose wheat fields were planted with contaminated seed were ordered to destroy their crops.

These requirements have resulted in additional costs and claims of losses to affected individuals. Wheat producers and handlers had loss in market value of their grain; seed companies and researchers have had similar losses, including lost royalties due to the disruption in the development of seed varieties. Other costs were for cleaning and disinfecting equipment and facilities, and damages to machinery caused by required treatment. Some of these losses are presented in Table 2.

TABLE 2.—IMPACT OF KARNAL BUNT QUARANTINE ACTIONS

Action	Regulated article	affected entities	Numbers affected	Types of impacts due to KB and quarantine actions
Plow-down & Seed Plot destruction ...	<ul style="list-style-type: none"> • Fields planted with infected seed at pre-boot stage 	<ul style="list-style-type: none"> • Certain producers in Texas and New Mexico 	<ul style="list-style-type: none"> • 4100 acres • 73 producers 	<ul style="list-style-type: none"> • Loss in value of wheat crop destroyed.
Cleaning/Disinfection	<ul style="list-style-type: none"> • Tools and Farm Equipment • Harvesters • Grain Trucks • Grain storage and loadout facilities • Harvesters • Harvesters • Harvesters • Railcars 	<ul style="list-style-type: none"> • Wheat producers in RA • Farmer owned and custom combines • Grain haulers from field to grain elevators • Grain handling firms • Combine harvester owners • Combines involved in pre-harvest sampling • Custom combine companies • Grain handling firms 	<ul style="list-style-type: none"> • 145 growers • 389 combines • 976 trucks • 17 elevators • 36 to 40 combines • 5 to 10 combines • 5 companies • 10,880 cars (511 for positive grain) • 145 growers • 6 handlers • 664 producers • 26.7 million bushels • 108 mills • 45,644 tons 	<ul style="list-style-type: none"> • cost of cleaning. • cost of cleaning. • cost of cleaning. • cost of cleaning. • Excess wear and tear on equipment. • Down-time on harvesters due to field testing. • Loss of income due to termination of contracts outside the RA. • cost of cleaning.
Restriction on Use or Marketings	<ul style="list-style-type: none"> • KB-positive milling wheat • KB-negative milling wheat • Millfeed • Movement restrictions on wheat seed 	<ul style="list-style-type: none"> • Producers • Grain handling firms • Producers in RA • Handlers in RA • Millers, millfeed processors • Seed producers, researchers, and companies 	<ul style="list-style-type: none"> • 15 producers • 9 research firms • 20 seed marketers 	<ul style="list-style-type: none"> • Loss in value of KB-positive wheat. • Loss in value of KB-negative wheat in RA. • Millers reluctance to mill KB-negative wheat from RA. • Loss in premiums • Loss in market value • Loss in royalties.

TABLE 2.—IMPACT OF KARNAL BUNT QUARANTINE ACTIONS—Continued

Action	Regulated article	affected entities	Numbers affected	Types of impacts due to KB and quarantine actions
	<ul style="list-style-type: none"> • Straw, Manure, Millfeed • Moratorium on wheat production on KB-positive fields • Soil on root crops grown on infected properties • Used seed sacks • Seed-conditioning equipment • Byproducts of seed 	<ul style="list-style-type: none"> • Straw producers and Handlers-Users of Straw • Livestock producers using wheat or straw produced in the RA • Flour millers • Millfeed processors/users • Producers with KB-positive properties • Vegetable producers on KB-positive properties • Seed research and marketing companies 	<ul style="list-style-type: none"> • 25 growers • 3 contractors • 1 straw user, making of straw mats for erosion control • 7 millers in 5 States • 2 millfeed processors • 109 growers • 13,674 acres • Unknown number • 9 research firms • 20 seed marketers 	<ul style="list-style-type: none"> • Loss in income • Increased cost of production. • Loss in income from wheat. • Increased cost of production. • Increased cost of production.

RA—Regulated Area.

Estimated losses in value to the affected wheat industry in the Southwest are discussed below. The major identified categories of losses include:

Plow-down of infected fields in New Mexico and Texas;

Loss in value of wheat testing positive for Karnal bunt for producers and handlers;

Loss in value of wheat testing negative for Karnal bunt for producers and handlers;

Cost of millfeed treatment;

Cleaning and disinfecting of grain storage facilities;

Loss in product value to handlers and growers with wheat inventories for past crop seasons;

Loss in product value to participants in the National Karnal Bunt Survey whose wheat or grain storage facility is found positive for Karnal bunt;

Loss in value of wheat seed and straw; and

Losses Related to Cleaning and Disinfecting Combine Harvesters and Other Losses.

These areas of economic loss are discussed below. Please note that losses have not been identified for participants in the National Survey, because Karnal bunt has not been discovered outside the original outbreak area of the Southwest. Also, losses to handlers and growers with wheat inventories for past crop harvest are included in the discussion of loss in value of negative testing grain.

With regard to wheat inventories for past crop harvest, historical data and field staff observations suggest that pre-1996 produced wheat inventories in the

quarantine areas represent a small fraction of the losses for negative testing grain, as leftover inventories are less than 5 percent of the annual production (1–2 million bushels).

1. Order to Plow Down Fields Planted with Infected Seed at Pre-Boot Stage.

Most of the acreage ordered to be plowed down in April 1996 was farm production acreage located in four counties in New Mexico (Dona Ana, Hidalgo, Luna, and Sierra) and in two counties in Texas (El Paso and Hudspeth). This acreage amounted to approximately 4,100 acres. Other affected acreage were small seed experimental plots in Washington, California, and South Dakota that totaled perhaps 50 acres in all.

Many affected growers were able to plant immediately with vegetables and recover some losses by farming alternative crops on affected land. Fertilizer carry-over on destroyed wheat fields was possible for crops grown on affected fields. The impact on farm income that could have been derived from wheat, however, is uncertain, as it is unclear what the market returns to wheat grown on known affected fields would have been if the plow-down order had not occurred.

2. Cost of Sanitizing Grain Storage.

The purpose of this requirement was to destroy spores and thereby reduce the likelihood of cross-contamination of grain storage facilities that came into contact with infected kernels or spores. The sanitization of facilities involves primarily fumigation with methyl bromide. Records of APHIS surveys in the regulated area indicate that 16 facilities were subject to cleaning. The

average cleaning cost of each facility is estimated at \$16,750, for a total cleaning cost of \$268,000 incurred to facility owners.

3. Loss in Value of Wheat Testing Positive for Karnal Bunt. Wheat testing positive for Karnal bunt (either by pre-harvest sample or by testing at the elevator site) was required to go into sealed storage. This movement of wheat out of the regulated area was restricted (exiting only with a limited permit) and most went into local animal feed uses after treatment that rendered ineffective any Karnal bunt spore. This involved a heat-roll-flaking process commonly in use for small grains for feed formulas in California. Infected wheat lost value as it was diverted from its original purposes to the animal feed markets where it had to compete against lower-priced feed grains. Similar discounts would have likely existed in the absence of regulatory actions.³

Eight percent of wheat production in the regulated area was found to be KB-positive. This level of production amounted to 2.32 million bushels of wheat taking a loss on average of \$1.80 per bushel, with an estimated total loss in value of positive wheat to producers and handlers of \$4.2 million.

4. Loss in Value of Wheat Testing Negative for Karnal Bunt. At harvest, many wheat buyers refused to honor purchase contracts with producers for

³Price discounts on both KB-positive and negative wheat could have been greater in the absence of regulatory action. While this may justify the regulatory action taken, the more convincing evidence is the large benefits of regulations to the greater part of the U.S. wheat industry outside of the regulated area.

their grain, most of which had been tested negative for Karnal bunt by pre-harvest sample. These contracts had been agreed upon before the discovery of the disease and the declaration of quarantine. Also, wheat millers inside and outside the regulated areas became reluctant to buy wheat from grain handlers due to the increased cost of handling wheat from the regulated areas. Prices for wheat produced within the regulated areas, therefore, dropped regardless of its disease status.

A total of approximately 26 million bushels of KB-negative wheat produced in the quarantine areas apparently suffered price losses. Ninety-two percent of the quantity produced for domestic milling (approximately 13 million bushels), plus the diverted quantity of KB-negative wheat that was originally intended to be exported (6 million bushels) could have experienced a price reduction. A portion of the remaining 7 million bushels intended for export that could not be sold at contract price could also experience a similar loss. We estimate that negative grain would suffer an average price drop of \$1.10 per bushel. Thus, total losses due to the decline in market value of KB-negative wheat held by producers and handlers could total \$28 million. This amount would be reduced by the amount of grain sold on contract which received full contract price. Producers would not have realized any losses on such production. Handlers may have incurred the full drop in value of their wheat sales depending on their previous contract prices. Given that information on contracts of individual producers and handlers is unknown, it is estimated that \$28 million is the potential maximum amount of economic loss due to a drop in value of uninfected wheat grown in the regulated area. However, the actual amount of grain that would experience a loss in value is expected to be lower.

5. *Cost of Millfeed Treatment.*

Millfeed is a byproduct of wheat milling (the outer husk of the wheat kernel and other byproducts from milling). Approximately 25 percent of the raw wheat going into milling comes out as millfeed, while the remaining 75 percent is converted into flour. The sale of this milling byproduct contributes around 10 percent towards their gross income from milling. With the higher likelihood of Karnal bunt being present in the millfeed rather than the flour, restrictions were placed on the movement of millfeed produced from wheat grown in the regulated areas. These restrictions stated that millfeed, before their addition into animal feeds,

were to be treated in order to render inactive any presence of Karnal bunt spores. For whole wheat kernels, this normally means that wheat undergo a heating-rolling-and-flaking process. Similar procedures, except for flaking, were assumed to be required in treating millfeed.

Many animal feed manufacturers commonly heat and treat ingredients in their feed products. The treatment requirements would not add any additional costs for them. For others, that restriction would place an additional processing cost of around \$35 per ton to their operation. Based on requests for compensation from millers in Minnesota, Missouri, Oregon, Wisconsin, and Virginia who are processing KB-negative wheat produced in a regulated area, we estimate the additional cost of mill feed treatment in response to the Karnal bunt quarantine to total \$1.6 million.

6. *Loss in Value of Seed.* Under the 1996 quarantine and emergency actions, wheat seed produced in the regulated areas was prohibited from sale outside of the regulated areas. Wheat seed intended for planting within the regulated areas must be sampled and tested for Karnal bunt, and for seed originating in a regulated area, treated prior to planting. These restrictions are estimated to have a significant impact on the seed industry, largely due to the high value that is commanded by propagative seed. Seed companies contract with growers to produce seed wheat at about 30 to 50 cents per bushel premium over non-propagative wheat. This premium reflects the added precautions in production to ensure seed integrity and cleanliness. These companies were affected by the decline in market value resulting from the inability to move seed out of the regulated areas. It is estimated that 1.5 million bushels of wheat seed sustained loss in value of between \$5 and 6 million. Seed developers, who earn returns on their investment in research and development of wheat varieties, also claim potential long-term losses in royalties; by receiving plant variety protection (or patent rights), seed developers then obtain royalties on future sales of wheat that are developed and sold for propagative purposes. Other economic losses suffered by the seed industry, but are difficult to quantify, include additional handling, storage, and finance costs on seed that could no longer be sold outside the regulated areas and costs to relocate wheat breeding operations outside of the regulated areas.

7. *Loss in Value of Straw.* Many growers sell wheat straw to supplement

their wheat grain income. Straw is sold for use at places such as racetracks, highway shoulders, feed yards, and parks for erosion control and to minimize muddy conditions. Wheat straw is listed in Karnal bunt regulations as a regulated article and is prohibited from being moved outside of the regulated areas. This has prevented many wheat straw producers from shipping their 1995-96 crop season straw to the intended markets. Some wheat straw was sold to alternative markets within the regulated areas for a lower price; other wheat straw was not able to be sold. These losses are estimated at about \$200,000.

8. *Losses Related to Cleaning and Disinfecting Combine Harvesters and Other Losses.* A number of costs have been claimed by about 220 combine harvesters operating within the regulated areas, and those who travel outside of the regulated areas to harvest crops. These losses are related to the cleaning and disinfecting requirements of combine harvesters, which particularly affected custom harvesters who contracted with the Agency to do pre-harvest sampling for Karnal bunt. These losses involved: (1) Excess damage to machines caused by treatment protocols; (2) cleaning and disinfecting costs; (3) down time and extra operational costs associated with testing of samples and treatment protocols; and (4) loss of business as wheat producers inside and outside the regulated areas switched to custom harvesters that were not associated with the 1996 wheat harvest in the regulated areas. The most serious of these claims that can be directly attributed to the regulations involves the excess wear and tear due to the subsequent corrosion on combines that underwent extensive cleaning and disinfecting treatments according to protocol. The loss in value of these combines is estimated at \$2 million.

Other economic losses that have been claimed by affected individuals in the regulated areas but that are difficult to quantify include additional handling, storage, and finance charges incurred by handlers of nonpropagative wheat and various other claims by producers and handlers in the regulated areas such as cleaning and disinfecting railcars and trucks and buying wheat from alternate sources to fulfill contracts that originally stipulated wheat produced from the regulated area. The Agency continues to gather information for quantifying costs to seed producers and others impacted by Karnal bunt or the Agency programs to limit it.

In sum, the quarantine and regulatory measures in the southwestern United

States were necessary to protect the wheat industry from a \$500 million loss in net sector income due to a drop in wheat export. The Southwest produces 3 percent of the U.S. wheat supply and its share of those losses would have been \$15 million, if the export losses were evenly distributed across the country. It is likely that although the export losses would become evenly distributed over time, the Southwest would suffer higher proportionate losses the first year since in the absence of a quarantine it would be perceived as the focus of a spreading infestation.

The impact of Karnal bunt and the subsequent quarantine actions on market value within the regulated area, as estimated in this analysis, should not exceed \$44 million (Table 3). As discussed in Section V below, \$39 million in compensation has been made available through budget apportionment to mitigate these losses.

While certain losses described above are clearly linked to the quarantine and emergency actions, it is likely that individuals suffering these losses alternatively would have shared the projected \$500 million in export losses which would have occurred in the absence of a quarantine. The costs incurred in destroying immature wheat fields in New Mexico and Texas are more clearly associated with complying with regulatory directives. It is unlikely that producers who planted with suspect wheat seed would have plowed under their fields without the order, because unless producers surveyed their fields or tested their grain the disease may not have become evident until several years in the future. The cleaning and disinfecting protocols for grain storage facilities and farm equipment, which resulted in additional operating expenses, can also be linked to regulatory requirements.

Regulatory requirements to sanitize railcars and treat millfeed caused many domestic mills to drop contracts with producers and handlers of grain from the affected areas, resulting in a decline in wheat prices within the regulated areas. In the absence of the regulatory requirement on millfeed, domestic wheat millers would have likely purchased negative-testing grain from the infected areas. Although some millers were reluctant, the high quality of the durum wheat produced within this area, coupled with a regulatory program that required testing, would have helped counter their reluctance. However, in addition to requiring testing the regulations required that millfeed be treated and railcars sanitized, which increased the costs of milling wheat from the regulated area by

\$35–40 per ton, and prompted many contracts with grain producers and handlers to be canceled.

It is reasonable to expect, however, that in the absence of regulation some portion of the losses would have resulted as the market responded to the disease. A number of importers refused to honor purchase contracts with handlers for negative-testing grain. This is due in part to the perceived risk of the product, and also due to the increased costs of taking precautionary measures in handling grain from the infected areas. Some decline in the value of uninfected wheat within the regulated area would have likely occurred upon discovery of Karnal bunt, even if quarantine actions were not invoked.

The actual share of losses that is directly attributable to the presence of the disease itself is difficult to quantify. Based upon the quantifiable losses calculated in this analysis, it is estimated that roughly 12 percent of the \$44 million in losses (those associated primarily with the plow-down, cleaning and disinfecting of storage facilities and combine harvesters, and treating millfeed) were incurred due to regulatory actions and requirements. The remaining 88 percent of the losses (composed of loss in value of negative-testing grain, seed and straw, and positive-tested wheat) occurred in the regulated area as the market concentrated its restrictions to those areas identified as having Karnal bunt.

Based upon the export experience of this past year, it is estimated that 25 percent of the wheat intended for export was diverted to other markets because countries refused to import wheat from the regulated area, despite APHIS' assurances the wheat had twice tested negative for Karnal bunt. These losses would have occurred if no regulations had been put into place and arguably more exports would have been diverted to other markets in the absence of regulation.

TABLE 3.—ESTIMATED LOSS IN VALUE DUE TO KARNAL BUNT REGULATIONS, 1995–96 CROP YEAR
[In million dollars]

Action	Estimated loss in value
1. Plowdown of NM and TX fields planted with infected seed	\$1.2
2. KB-positive grain diverted to animal feed market	4.2
3. KB-negative grain that experience loss in value	128.0
4. Cost of sanitizing storage facilities	0.3

TABLE 3.—ESTIMATED LOSS IN VALUE DUE TO KARNAL BUNT REGULATIONS, 1995–96 CROP YEAR—Continued

[In million dollars]	
Action	Estimated loss in value
5. Millfeed treatment of KB-negative grain	1.6
6. Loss in value of seed	6.0
7. Loss in value of straw	0.2
8. Loss related to cleaning and disinfecting of combine harvesters	2.0
Total	44.0

¹ \$28 million is the potential maximum amount of loss in value of uninfected wheat.

V. Federal Compensation To Mitigate Losses

The Karnal bunt quarantine that was initially established was necessarily broad due to the lack of data available at the time as to the extent of the infestation. The discovery of Karnal bunt and subsequent quarantine and emergency actions occurred after production and marketing decisions had been made. Producers and other affected individuals had little time or ability to avoid the unexpected costs or pass those costs on to others in the marketing chain. The impact was particularly severe on the wheat industry in the affected area because much of the crop is grown under contract at specified amounts and prices.

In order to alleviate some of these hardships and to ensure full and effective compliance with the quarantine program, compensation to mitigate certain losses was offered to producers and other affected parties in a regulated area. The payment of compensation is in recognition of the fact that while benefits from regulation accrue to a large portion of the wheat industry outside the regulated areas, the regulatory burden falls predominantly on a small segment of the affected wheat industry within the regulated area.

For the 1996 wheat crop, \$39 million in compensation funding, including pending compensation actions, has been made available to USDA through budget apportionment.

The Agency has identified three principles for deciding whether to provide compensation. First, compensation may be appropriate where quarantine and emergency actions cause losses over and above those that would result from the normal operation of market forces. Payment of compensation would reflect the

incremental burdens of complying with regulatory requirements insofar as market forces would not otherwise impose similar or analogous costs. Second, compensation may be appropriate where parties undertake actions that confer significant benefits on others. Under this principle, payment of compensation would be intended to overcome the usual disincentives to produce such benefits. Third, compensation may be appropriate where a small number of parties necessarily bears a disproportionate share of the burden of providing such benefits. This principle rests on the widely shared belief that burden-sharing is a fundamental principle of equity.

The Agency compensation plan for Karnal bunt proceeds from these three principles. Individual decisions regarding what specific losses to compensate and how much compensation to offer in each case were made in line with the above basic principles which describe the goals of compensation. A top equity priority was compensation for costs of plowing down fields, and for wheat and other articles the Agency ordered destroyed or prohibited movement. Compensation amounts took into account the need to mitigate real losses caused by the regulations, so that regulated parties would not have a strong economic incentive to avoid compliance. At the same time, amounts were not set at a high enough rate to establish a "bounty" that would encourage fraudulent claims or behavior that would result in increases in contaminated wheat or other articles eligible for compensation.

The compensation committed to date for the 1995-96 crop year, as published as an interim rule in the **Federal Register** on July 5, 1996, and adopted in a final rule published in this issue of the **Federal Register**, included compensation for:

- Plow-down of infected fields in New Mexico and Texas;
- Loss in value of wheat testing positive for Karnal bunt for producers and handlers;
- Loss in value of wheat testing negative for Karnal bunt for producers and handlers;
- Cost of millfeed treatment;
- Cleaning and disinfecting of grain storage facilities;
- Compensation for handlers and growers with wheat inventories for past crop seasons;
- Compensation for participants in the National Karnal Bunt Survey whose wheat or grain storage facility is found positive for Karnal bunt.

These areas of compensation are discussed below. Please note that compensation has not been necessary for participants in the National Survey, because Karnal bunt has not been discovered outside the original outbreak area of the Southwest. Also, losses to handlers and growers with wheat inventories for past crop harvest are included in the discussion of loss in value of negative testing grain.

To offset for costs related to the plow-down, compensation was offered to 74 producers to cover the \$25 per acre plowing cost plus the \$275 per acre in average cost of production expenses (up until the time the crop was destroyed). In total, these producers received compensation of \$1.02 million to cover operating costs incurred for growing wheat.

Compensation is committed to owners of contaminated grain storage facilities on a one-time only basis for up to 50 percent of the cost of decontamination, not to exceed \$20,000. Total cost of compensation, as of March 14, 1997, is estimated at \$134,000, with an average compensation per facility of \$8,375.

The total compensation expected to be paid for the loss of value of both KB positive wheat and KB negative wheat from the regulated areas is approximately \$25 million. Compensation paid as of March 14, 1997, is estimated at \$12,409,000. The categories of wheat eligible for compensation are discussed below.

Program guidelines limited maximum compensation rates for KB positive wheat to \$2.50 per bushel; producers were asked to establish financial losses by calculating the difference between their contract price and actual prices received (if production was pre-contracted) or the difference between the estimated market value in May-June 1996 and their actual prices received (if production was not pre-contracted). Handlers were limited by the same maximum compensation amount, but determination of financial loss was based on the difference between their wheat purchase price and a \$3.60 per bushel salvage value. They may have had additional costs to sort and treat their KB-positive wheat (after finding their KB-negative wheat was, in fact, KB-positive). Moreover, many handlers were reluctant to accept wheat from affected areas. This expedited procedure was offered to handlers in order to reduce administrative and recordkeeping costs by not addressing their losses on a contract-by-contract basis. It provided assistance that avoided a market collapse.

For those growers who grew wheat under contract but who did not receive

full contract price, compensation for loss in value of wheat testing negative for Karnal bunt is made based on the difference between the contracted price and the higher of the actual price received by the producer or the salvage value. (Salvage value was to equal whichever price was higher of the following: The average price paid in the region of the regulated area where the wheat was sold for the period between May 1 and June 30, 1996; or \$3.60 per bushel.)

Compensation for growers of nonpropagative wheat not grown under contract is based on the difference between the estimated market price for the relevant class of wheat and the higher of the actual price received or its salvage value. (Salvage value was to be the same as above for contracted wheat.) The estimated market price is what the market price would have been if there were no quarantine for Karnal bunt, and is calculated for each class of wheat, taking into account the prices offered by relevant terminal markets (animal feed, milling, or export) for the period between May 1 and June 30, 1996, with adjustments for transportation and other handling costs. The compensation formula for negative grain would suggest an average price drop of \$1.10 per bushel.

In order to encourage wheat marketings from the regulated areas and reassure millers that they would not incur any additional costs in handling uninfected wheat from a regulated area, a \$35 per ton cost offset for heat treatment was offered to millers using KB-negative wheat produced in a regulated area. As of March 14, 1997, 108 requests have been made from millers in Minnesota, Missouri, Oregon, Wisconsin, and Virginia for a total of \$1.7 million.

It should be noted that, as stated in the interim rule of July 5, 1996, the Agency is developing a compensation plan for the loss in value of 1995-96 crop season seed. This plan will be published in a future edition of the **Federal Register**. Compensation for loss in income due to the restrictions placed on movement of straw and damaged custom harvesters will also be addressed in a future edition of the **Federal Register**.

Compensation payments for loss in value, while not accounting for every loss or expense due to the disease or regulation, limited the adverse impact on wheat sector income of affected individuals within the regulated areas. The final amount of compensation for grain testing negative and for millfeed treatment will depend on the marketing distribution of the 1996 wheat crop and

will be proportionately lower the greater the amount of wheat that is exported.

VI. Conditions for Wheat Production and Utilization in a Regulated Area for the 1996-97 Crop Year

Based upon survey data identifying the location of fields that have tested positive, the regulations in effect during the 1996 harvest were modified in 1997 for some areas within the initial quarantine. The final rule published on October 4, 1996, set forth criteria by which fields in regulated areas would be classified into two risk classes in the 1996-97 crop year. The effects of being classified in a particular category are outlined in Table 4.

In each regulated area, all or a portion of that regulated area is designated as either being a restricted area or a surveillance area. There are two

differences between being designated a restricted area and a surveillance area. First, grain from a restricted area that tests negative for Karnal bunt may move under a limited permit from the regulated area to designated facilities under safeguard and sanitation conditions; grain from a surveillance area that tests negative for Karnal bunt may move under a certificate to any destination without restriction. Additionally, millfeed from grain produced in a restricted area is required to be treated, whereas millfeed from grain produced in a surveillance area is not required to be treated.

Each restricted and surveillance area is further divided into individual fields within the respective areas. Each field within a restricted area will fall into one of three categories: (1) A field in which

preharvest samples tested positive; (2) a field planted with known contaminated seed in 1995; or (3) any other field within the restricted area. In a surveillance area, each field will be designated as (1) a field planted with known contaminated seed in 1995; or (2) any other field in the surveillance area. In a restricted area, in fields in which preharvest samples tested positive, no Karnal bunt host crops may be planted in the 1996-97 crop season. The same prohibition applies to fields in both restricted areas and surveillance areas which were planted with known contaminated seed in 1995. Also, as noted above, millfeed from grain from a field in the "any other field" category in a restricted area must be treated; millfeed from a surveillance area need not be treated.

TABLE 4.—CONDITIONS FOR WHEAT PRODUCTION AND UTILIZATION IN A REGULATED AREA

	Definition	Host planting	Seed	Decontamination	Millfeed	Survey	Disposition of grain
Restricted Area Category:							
1	Fields in which preharvest samples tested positive.	No host planting in 1996-97 crop season.	N/A	Equipment movement outside regulated area: cleaned and sanitized. Movement within: no restrictions.	N/A	N/A	N/A.
2	Fields planted with known contaminated seed in 1995.	No host planting in 1996-97 crop season.	N/A	Equipment movement outside regulated area: cleaned and sanitized. Movement within: no restrictions.	N/A	N/A	N/A.
3	All other fields within restricted area.	No restrictions	Tested and, if from regulated area, treated prior to planting only within regulated area.	Equipment movement outside regulated area: cleaned and sanitized. Movement within: no restrictions.	Required, unless destination State controls disposition /movement.	Double tested: Sampled in field at harvest; composite sample prior to movement.	Movement of grain testing positive restricted; grain testing negative may move under limited permit to designated facilities under safeguard and sanitation conditions.
Surveillance Area:							
4	Fields planted with known contaminated seed in 1995.	No host planting in 1996-97 crop season.	N/A	Equipment movement outside regulated area: cleaned and sanitized. Movement within: no restrictions.	N/A	N/A	N/A.

TABLE 4.—CONDITIONS FOR WHEAT PRODUCTION AND UTILIZATION IN A REGULATED AREA—Continued

	Definition	Host planting	Seed	Decontamination	Millfeed	Survey	Disposition of grain
5	All other fields located in definable area where no fields in risk level 1 are located.	No restrictions	Tested and, if from regulated area, treated prior to planting only within regulated area.	Equipment movement outside regulated area: cleaned and sanitized. Movement within: no restrictions.	Not required	Double tested: Sampled in field at harvest; composite sample prior to movement.	Movement of grain testing positive restricted; grain testing negative may move under certificate. Safeguard and sanitation of rail-cars not required.

The number of wheat acres that is estimated to fall into the various risk categories in the 1996–97 crop season is presented in Table 5. The amount of wheat acres in the regulated area is estimated to be greatly reduced from the

previous years largely due to factors affecting the wheat industry as a whole (in particular, the projected decline in export demand for U.S. wheat). Wheat acres are estimated to decline by 36 percent in the regulated areas of

Arizona, an average of 24 percent in the three affected counties of California, and 20 percent each in New Mexico and Texas.

TABLE 5.—PROJECTED 1997 REGULATED WHEAT ACREAGE, BY RISK CATEGORIES ¹

Risk category	Arizona	California			New Mexico	Texas	Total acres
		Imperial Valley	Bard/Winterhaven	Blythe			
	Acres						
Restricted Area	9,200	40	450	3,239	494	13,423	
Surveillance Area	105,800	90,000	3,960	4,050	4,128	211,844	
Total 1997 Regulated Area	115,000	90,000	4,000	4,500	7,367	225,267	
1996 Regulated Area	180,000	106,592	8,909	14,000	9,209	324,204	

¹ Estimates obtained from the Karnal Bunt Task Force, Arizona.

Overall, the impact of the Karnal bunt restrictions is likely to be lessened for many growers and other individuals, as a large portion of the regulated acres falls into the less restrictive surveillance category. Additionally, an interim rule published in the **Federal Register** on May 1, 1997 (Docket No. 96–016–19, 62 FR 23620–23628), established a new standard for defining regulated areas for Karnal bunt based on finding bunted wheat kernels rather than just spores. That interim rule substantially reduced the size of the harvested wheat area regulated for Karnal bunt, in addition to the market-based decline in wheat acres in the regulated areas above. Wheat production can still occur on fields in the regulated areas (in restricted category 3), on land which was not previously planted with wheat in 1996. Growers who choose to plant wheat in these areas are minimally restricted by regulations as grain that tests negative for Karnal bunt can move under limited permit to designated facilities.

Approximately 10,000 acres in risk categories 1 and 4 are prohibited from planting wheat. The value of wheat production that could have been harvested from these fields, calculated at an average price for durum wheat before the disease outbreak of \$5.50 per bushel, would have been less than \$6 million.⁴ The impact on growers with fields in these categories, however, is uncertain. While the restrictions deny income that could be earned from wheat, they do not preclude the planting of other non-host crops, such as barley, alfalfa, cotton, and vegetables. In many of the infected areas, especially on irrigated operations, wheat is either double-cropped or grown on rotation with other non-host crops. The impact on producers in these risk categories would therefore be minimized with rotation. Barley would likely be grown on these fields: county crop budget data

⁴The estimate is based on an average yield of 100 bushels per acre for durum wheat produced in the desert Southwest.

from Arizona indicate that, except for barley, the historical net returns obtained from wheat production are actually lower than the net returns for all other crops.⁵

It should be noted that changes in the compensation plan to remunerate for certain losses are being developed and will be published in a future edition of the **Federal Register**. Information received through public comments and other forums is invaluable in refining regulatory policies regarding Karnal bunt. With no prior experience in regulating the disease, the improvement of the Karnal bunt program requires ongoing input from the public. This process will enable the Agency to better protect the wheat growing areas of the United States, while causing the least possible disruption to the affected areas.

⁵ Other rotational crops include alfalfa hay, sudan hay, upland and pima cotton, safflower, and lettuce.

VII. Consideration of Alternatives to the Rule

A number of alternatives to the quarantine were considered by the Agency in controlling the disease outbreak. One alternative was to limit the scope of the 1996 quarantine by regulating only fields that tested positive for Karnal bunt. This option was rejected for the following reasons. Karnal bunt was originally detected in many certified wheat seed lots produced in Arizona, as well as in some grain in storage from a previous harvest. The information available to the Agency indicated that seed from the infected lots were planted widely in parts of Arizona and California, and in a few counties in Texas and New Mexico. This infected seed could not be traced to specific fields because the process of seed certification in Arizona allows seed from different fields to be commingled in making a seed lot. Because Karnal bunt spores can remain viable in soil for as long as 4 to 5 years, and because wheat is planted in rotation in the Southwest, the actual infestation would not be apparent until fields came into rotation with wheat. Moreover, the detection of Karnal bunt spores in some grain in storage from the 1993 harvest indicated that the disease had been present for at least several years. Given that there is currently no feasible soil test, the disease, in this situation, could only be detected as wheat is planted. The unknown extent of the infestation in Arizona and California necessitated broader control actions than those offered by quarantining infected fields. In New Mexico and Texas, where wheat acreage planted with suspect seed was limited and the wheat crop was immature, regulatory actions were directed at plow-down of those fields.

Another alternative available to the Agency would be not to quarantine. This alternative was rejected as it could not be justified given the risk of spread of Karnal bunt to uninfected areas and the potential for significant losses in the wheat export market. The quarantine actions to prevent disease spread serve to instill domestic and foreign consumer confidence in the integrity of U.S. wheat. The 1995-96 Karnal bunt program provided pre-harvest sampling of all wheat fields; compensation for losses as a result of Agency actions; and remuneration to offset part of the additional costs in handling and treating wheat produced in the regulated area (through a millfeed cost offset and a cost-share facility clean-up program with grain handlers). Without Federal intervention, it is conceivable that farm income of wheat producers both within

the affected area, and outside the regulated area, would have been more negatively impacted. Therefore, it is also conceivable that Federal intervention to prevent the spread of KB beyond the regulated areas and to identify the KB status of acres within the regulated areas may have had a salutary effect on the market and a beneficial impact on prices both within and outside the regulated areas.

When the treatment protocols for regulated articles were established, few options to the requirements were made available to affected wheat growers, handlers, and combine owners. These specific protocols were based on the best scientific information available on disease management in other countries affected by Karnal bunt. Furthermore, the decision to require millfeed treatment, as with other treatment requirements, was based on risk assessments that were conducted to determine the acceptable level of risk of the various modes of transportation of the disease. Compensation is thus being considered to offset unanticipated losses and damages caused by the regulatory requirements.

VIII. Regulatory Flexibility Analysis—Impacts on Small Entities Within the Regulated Area

The Regulatory Flexibility Act requires that agencies assess the impact of regulations on small businesses, organizations, and governments. A majority of the firms in the affected area can be classified as small based on criteria established by the Small Business Administration (SBA). Much of the analysis on impacts discussed in the previous sections are therefore applicable to these firms. Unless otherwise noted, the SBA's characterization of a small business for the categories of interest in this analysis is a firm that employs at most 500 employees, or has sales of \$5 million or less. The SBA defines a "small" wheat producer as having sales of less than \$500,000.

In addition to private businesses that produce and handle grain in the regulated area, there were a number of other parties, such as governmental and quasi-governmental entities and industry organizations, that were also affected by the quarantine. For example, farm organizations that represented producer interests were impacted by the reduced activity due to a change in farm receipts. Local governments may also have experienced a change in the business activity level, and thus tax receipts, due to lower farmer spending. Seed certification boards are expected to see lower levels of seed certification as

the demand for seed is reduced. State and county departments of agriculture could also have experienced increased financial burdens as regulatory responsibilities related to Karnal bunt surveillance and protocol monitoring increased on the local level. The magnitude of these effects, however, are not quantifiable. The information below describes the number of firms affected and provides insight into the impact on small entities due to Federal regulations.

Number of Producers and Acreage in Regulated Area (RA): There were 5,657 farms in the counties of the RA as reported in 1992 with 1,501,089 acres.⁶ About 1/3 of the reported total acreage was irrigated. There were 598 wheat growers in the counties of the RA: 236 in California (out of 2,236 wheat growers in the State); 310 in Arizona; 40 in New Mexico (out of 892 in the State); and 12 in Texas (out of 14,877 in the State). Total wheat acreage reported in these counties in 1992 was 176,753 acres producing 13.3 million bushels. Wheat acreage represented less than 12 percent of total farm acreage.

Characteristics of Producers in the RA: Similar cotton and vegetable production data suggest that the primary source of income in these areas is derived from cotton and vegetable production. Cotton acreage in the counties of the RA was reported at 496,284 acres on 1,301 farms in 1992. Vegetables grown for harvest was reported on 509 farms with 202,694 acres. The acreage and number of producers growing wheat, cotton, and other crops vary from year to year depending on rotations, price and weather expectations, and other factors. Wheat is often a rotation crop in cotton and vegetable crop production providing a more stable income while "resting the soil" and providing weed control. Common rotations call for wheat in one year in three. Data for the Pacific region indicate that the previous crop on 57 percent of the wheat acres in 1989 had crops other than wheat.⁷ Forty-percent had wheat, while 2 percent had corn and 1 percent had sorghum as the previous crop.

Of the total 598 wheat farms in the counties of the RA, 577 (or 96.5 percent) were growing wheat on irrigated fields. Of the 598 wheat producers in the RA, 86 percent of producers harvested 499 acres or less of wheat. These 514 wheat producers are assumed to be classified in the SBA business classification as

⁶Source: 1992 Census of Agriculture.

⁷Source: Economic Research Service, *Characteristics and Production Costs of U.S. Wheat Farms, 1989*, October, 1993.

being "small entities." It is assumed that the other 84 growers are excluded from this business classification. Wheat growers in the RA typically lack on-farm storage.

Acres Affected: By 1995/96, the amount of planted wheat acreage in the counties of interest had increased; the total number of growers in the RA was reported at 882 growers (455 in Arizona, 354 in California, 72 in New Mexico, and 1 in Texas), with wheat acreage totaling over 300,000 acres. Approximately 145 growers were found to have grown KB-positive wheat, and 73 growers were issued plow-down orders. As a percentage of the total in the four States of the RA, quarantine actions affected less than 3.3 percent of producers, 3.75 percent of wheat acreage, but almost 8 percent of wheat production.

Based on the SBA's size definition, 86 percent of producers (514 out of 598) are assumed to be classified within the small business category. Thus, the major part of any impact from Karnal bunt or Karnal bunt regulations is assumed to fall on these individuals.

Harvesters: Harvesting equipment is expensive and specialized for many agricultural crops. With a cost of over \$130,000 for a new combine and only a limited time of use, many wheat growers in the regulated area depend on custom operators or "custom cutters" to harvest their wheat crop. It is estimated that about 390 combines were needed to harvest the 1995/96 wheat crop in the regulated area, with much of it being supplied by custom cutters. There were probably 20 to 30 firms engaged in this business activity (not including individuals who may have done some custom cutting of neighboring properties). All firms are assumed to be classified in the SBA classification as being a "small business." It is assumed that only a few of these firms, namely those that were subjected to extensive cleaning and disinfection if they had harvested many KB-positive fields, suffered losses to their machinery as a result of quarantine actions. Additional losses occurred because some harvesters were not allowed to bring their equipment to certain States.

Wheat Seed Dealers: Wheat seed dealers sell seed to growers to produce their crop for milling. They also represent seed wheat research firms in that they sell wheat seed that is grown to be used as seed for the next growing season or for export. This wheat seed is called private variety seed as it was developed by a private firm and has a plant variety protection "patent" on that variety. There are approximately 25 to 30 seed marketing firms in the RA; some

specialize in acquiring seed production from the RA for export. Probably 3 to 4 seed wheat dealers have over 80 percent of the seed business in the RA. These firms were affected by quarantine actions, i.e. by the restriction on selling or transferring seed out of the RA. Some of these firms derive their income from other enterprises such as vegetable production, rather than solely from wheat production and marketing. The number of firms that can be classified as "small" cannot be determined due to the proprietary nature of sales records.

Seed Wheat Research Firms: Seed wheat research firms take the risk and have the expertise to develop new wheat varieties for future use. Many develop a relationship with a seed wheat dealer (who is then called an "associate") to market the developers' specific varieties. Seed wheat research firms use seed production in the RA as a basis for seed to be used in climates similar to the RA, e.g. the Mediterranean, or use production in the RA as seed increases" to be used in Northern climates the following spring. There are approximately 5 to 9 commercial seed wheat research firms engaged in the RA, with perhaps 3 to 4 major firms conducting over 70 percent of research activity. Also, there are small firms in the RA that specialize in "seed increases" for varieties being developed by universities, private companies, and foreign countries. The number of firms that can be classified as "small" according to SBA standards cannot be determined due to the proprietary nature of sales records.

Custom Haulers: There are approximately 130 to 140 individuals in the RA that haul grain from fields directly after harvest to storage and load-out locations (referred to as grain handlers). Some of these individuals also haul farm machinery from field to field to prepare or harvest wheat and other crops. The number of firms that can be categorized as a "small business" is unknown.

Grain Handlers: Grain handlers store and unload nonpropagative wheat received from growers. Wheat is received by trucks, pickups, and farm tractors pulling either grain buggies or farm wagons. Ownership of the wheat is usually transferred from the grower to the grain handler. It is estimated that there are 92 such assembly sites in the RA (50 in Arizona, 33 in California, 8 in New Mexico, and 1 in Texas). Off-farm storage capacities are only available on a State-wide basis⁸:

⁸Source: Grain and Milling Annual 1996. Off-farm capacities may also reflect storage capacities of millers.

Arizona (22.3 million bushels), California (98.04 million bushels), New Mexico (15.63 million bushels); and Texas (840.2 million bushels). The SBA defines a small grain elevator as one that employs fewer than 100 employees. It is estimated that nearly all of the elevators in the regulated areas can be classified as "small."

Wheat Millers: The number of wheat millers for the four States are⁹: California (12, with 1 processing durum); Arizona (2, with 1 processing durum); New Mexico (none); Texas (7, with 1 processing rye). There were 24 millers in and around the RA that entered into limited permits with APHIS: 2 in Arizona, 1 in New Mexico, and 21 in California. Limited permit data indicate that millers in the following States were also affected: Minnesota, Oregon, Virginia, Missouri, and Wisconsin. The size of these operations could not be estimated in terms of their SBA classification as "small" or "large" businesses. However, these firms are likely to be classified as a "small" business.

Prepared Feed Manufacturers: The number of animal feed manufacturers and/or millfeed processors in the Riverside-San Bernardino primary metropolitan statistical area (PMSA) is 15, and there are 11 in Arizona.¹⁰ Only 12 of these 26 establishments employed over 20 employees. The Riverside-San Bernardino PMSA data indicates that the 15 establishments in that area collectively employed a total of 600 workers with a \$20.5 million payroll (8 establishments of the 15 employed more than 20 employees). Based on these data, it is estimated that these larger firms employ about 62 workers on average and smaller firms had 15 workers per firm. Similar data for Arizona show that 4 of the 11 establishments in that State employed more than 20 employees. Given these scant data and SBA's definition of a "small business" in this group (SIC 2048)—i.e., an establishment with fewer than 500 employees—it is assumed that all firms fall in SBA's "small" business category.

Feedlots: It is estimated that about 24 feedlots in the RA (presumably feeding beef cattle) were affected by the regulations. They were found in Arizona (16), New Mexico (3), and California (5). SBA's definition of a "small business" in this group (SIC 0211) is an establishment with sales less than \$1.5

⁹See footnote 8.

¹⁰Source: U.S. Department of Commerce, Economics and Statistics Administration, Bureau of Census, various State reports on California and Arizona, Manufacturers—Geographic Area Series, 1992.

million. No sales data on these firms were available, so it is not possible to estimate the number of firms that do not fall in SBA's small business category.

Based on the above information, we have concluded that the majority of the impact of Karnal bunt and subsequent regulations falls on small businesses. It is conceivable, however, that without Federal intervention, individual States and importing countries would place their own, perhaps more severe, restrictions on wheat shipments from the regulated areas. The 1996 Karnal bunt program provided pre-harvest sampling of fields and other measures to ensure the quality of wheat from the regulated areas. The use of limited permits for uninfected wheat further facilitated the marketing flow of wheat, thereby enabling the wheat industry within the regulated areas to be preserved.

IX. Summary and Conclusions

The imposition of quarantine and emergency actions against Karnal bunt was a necessary, short-run measure taken to prevent the artificial spread of the disease to other wheat-producing areas in the United States. The establishment of Karnal bunt would have had serious adverse impact on the wheat export market, as over half of U.S. wheat exports are to countries that maintain restrictions against imports from countries where Karnal bunt is known to occur. In the absence of regulatory action, it is conceivable that farm income both within and outside the regulated areas could have been further jeopardized.

Given the regulatory objective of disease eradication, the quarantine measures to control a new disease

outbreak such as Karnal bunt is necessarily broad due to the lack of information on the extent of the outbreak. These actions, enacted after production and marketing decisions were in place, undoubtedly had an adverse impact on growers and other affected individuals; many were likely unable to recover unexpected costs. The loss in market value due to the quarantine is estimated at \$44 million. The majority of affected individuals and firms can be classified as "small" based on criteria established by the Small Business Administration.

In order to reduce the economic impact of the quarantine on affected wheat growers and other individuals, compensation was provided to mitigate certain losses and expenses. The payment of compensation is in recognition of the fact that while a large portion of the benefits of regulation accrue to others outside the regulated area, the regulatory burden falls disproportionately on a small segment of the industry. Indeed, it could be argued that without compensation, the regulatory actions would not have been economically justified, as the costs of disease control that are borne now could have a greater weight than benefits that are received in the future.

Based upon our analysis, we have concluded that our quarantine measures were appropriate and justifiable when compared with the magnitude of the benefits achieved. Even a 10-percent reduction in wheat exports would have a significant effect on wheat sector income. It is estimated that a 10-percent decrease in U.S. wheat exports would cause a decline in wheat sector income of over \$500 million.

As of April 4, 1997, \$39 million in compensation funding has been made available to USDA through budget apportionment. While not accounting for every loss or expense due to the disease or regulation, compensation for loss in value lessened the adverse impact on wheat sector income within the regulated areas.

As more information is obtained on disease prevalence, the number of regulated acres are reduced and restrictions for the 1996-97 crop season are modified to be commensurate with the level of risk. The impact on those that are affected by regulation would also likely be reduced; unlike in 1996, the 1997 restrictions on wheat planting are known in advance and can, therefore, be taken into account when cropping decisions are made.

Wheat acreage in the regulated areas is projected to decline from 1995-96 levels, largely due to decreased demand for U.S. wheat exports. Less than 5 percent of the acres in the regulated areas is prohibited from planting wheat. The impact on farm income due to this prohibition is uncertain, as wheat is normally rotated with other crops. Overall, the impact of the Karnal bunt restrictions on wheat production in the regulated areas is likely to be small, as wheat can still be grown on ample, available land that was not planted with wheat in 1996.

Done in Washington, DC, this 30th day of April 1997.

Donald W. Luchsinger,

Acting Administrator, Animal and Plant Health Inspection Service.

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