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## DEPARTMENT OF AGRICULTURE

### Animal and Plant Health Inspection Service

#### 7 CFR Part 318

[Docket No. 03-062-2]

#### Irradiation of Sweetpotatoes From Hawaii

**AGENCY:** Animal and Plant Health Inspection Service, USDA.

**ACTION:** Affirmation of interim rule as final rule.

**SUMMARY:** We are adopting as a final rule, without change, an interim rule that amended the regulations to provide for the use of irradiation as a treatment for sweetpotatoes to be moved interstate from Hawaii. The interim rule also provided that the sweetpotatoes have to meet certain additional requirements, including inspection and packaging requirements. The interim rule provided for the use of irradiation as an alternative to methyl bromide for the treatment of sweetpotatoes moving interstate from Hawaii.

**EFFECTIVE DATE:** The interim rule became effective on June 26, 2003.

**FOR FURTHER INFORMATION CONTACT:** Dr. Inder P. Gadh, Import Specialist, Phytosanitary Issues Management Team, PPQ, APHIS, 4700 River Road, Unit 140, Riverdale, MD 20737-1236; (301) 734-6799.

#### SUPPLEMENTARY INFORMATION:

##### Background

The regulations in 7 CFR part 318 prohibit or restrict the interstate movement of fruits, vegetables, and certain other articles from Hawaii, Puerto Rico, the U.S. Virgin Islands, and Guam to prevent the introduction and dissemination of plant pests into the continental United States.

Within part 318, "Subpart—Sweetpotatoes" (§§ 318.30 and 318.30a,

referred to below as the regulations) quarantines Hawaii, Puerto Rico, and the U.S. Virgin Islands because of the sweetpotato scarabee (*Euscepes postfasciatus* Fairm. [Coleoptera: Curculionidae], also known as the West Indian sweetpotato weevil) and the sweetpotato stem borer (*Omphisa anastomosalis* Guen. [Lepidoptera: Crambidae], also known as the sweetpotato vine borer) and restricts the interstate movement of sweetpotatoes (*Ipomoea batatas* Poir.) from those places.

In an interim rule effective and published in the **Federal Register** on June 26, 2003 (68 FR 37931-37936, Docket No. 03-062-1), we amended the regulations governing the interstate movement of sweetpotatoes from Hawaii by providing for the use of irradiation as a treatment for sweetpotatoes to be moved interstate from Hawaii. The interim rule provided that the sweetpotatoes must be irradiated at a dose of 400 Gy (40 krad) and must also meet certain additional requirements, including inspection and packaging requirements. The interim rule provided an alternative to fumigation with methyl bromide for the treatment of Hawaiian sweetpotatoes.

Comments on the interim rule were required to be received on or before August 25, 2003. We received three comments by that date. The comments were from an entomologist, a public interest group, and an industry association. The comments are discussed below by topic.

##### General Comments

One commenter noted that sweetpotato growers in the mainland United States have made continuing efforts to control insect pests that affect their production of sweetpotatoes, such as wire worms, cucumber beetle, flea beetle, grubs, fusarium, pox, and nematodes. This commenter further noted that sweetpotato breeders are working to develop varieties of sweetpotato that are resistant to these pests. The commenter recommended that, rather than risk the introduction of new pests of sweetpotatoes into the mainland United States, the Hawaiian growers interested in moving their sweetpotatoes interstate contract with sweetpotato breeders to develop varieties of sweetpotato that are resistant to the pests named in the pest

risk assessment (PRA) that we conducted as a basis for the interim rule.

Prior to the interim rule, sweetpotatoes from Hawaii were allowed to move interstate if they had been fumigated with methyl bromide to mitigate the risks identified in the PRA. The interim rule simply provided sweetpotato growers with an alternative treatment, irradiation, that we believe is equally effective at mitigating the same risks. Hawaiian sweetpotato growers are free to develop varieties of sweetpotato that are resistant to sweetpotato pests present in Hawaii, but the Animal and Plant Health Inspection Service (APHIS) has no authority to compel them to do so. We believe that both fumigation and irradiation effectively mitigate the risk of pest introduction associated with the interstate movement of sweetpotatoes from Hawaii. We are making no changes in response to this comment.

One commenter pointed out two spelling errors in the preamble of the interim rule and requested two other nonsubstantive clarifications to language in the preamble. Because these comments do not affect the regulatory language we established in the interim rule, we are making no changes to the interim rule in response to these comments. However, we have corrected the spelling of the previously misspelled terms and used the clarifications suggested by the commenter in the discussion of comments below.

##### Risk Mitigation Measures

One commenter objected to the inclusion of the ginger weevil (*Elytroteinus subtruncatus* [Coleoptera: Curculionidae]) on the list of quarantine pests associated with the interstate movement of sweetpotato from Hawaii. (The PRA that was the basis for the interim rule included the ginger weevil as a quarantine pest associated with such movement because it had been found as a hitchhiker on sweetpotato from Hawaii.) This commenter stated that the ginger weevil has not been documented as a pest of sweetpotato and that the interception data did not provide a sufficient basis for including the ginger weevil as a quarantine pest associated with the interstate movement of sweetpotato from Hawaii.

As the PRA stated, we do not have evidence that can confirm that sweetpotatoes do not serve as a host for

the ginger weevil. In any case, fumigation with methyl bromide or the alternative irradiation treatment provided by the interim rule remains necessary to neutralize the sweetpotato scarabee and the sweetpotato stem borer, whose association with the interstate movement of sweetpotatoes from Hawaii this commenter did not dispute. Therefore, we are making no changes to the alternative irradiation treatment provided for by the interim rule in response to this comment.

One commenter requested that we clarify the meaning of the term "neutralize" as it applies to the effects of irradiation treatment on plant pests.

A pest is considered to have been neutralized by a treatment if the treatment has prevented the pest from establishing itself in an area where it is not currently present. For irradiation treatment, neutralizing a pest generally refers to either sterilizing the pest or preventing it from achieving sexual maturity, although irradiation treatment can in some cases kill pests that may be present.

Two commenters objected to the fact that the interim rule was promulgated before specific research was completed to determine the dose necessary to neutralize the three pests that the PRA identified as targets for treatment: The ginger weevil, the sweetpotato scarabee, and the sweetpotato stem borer. One commenter pointed out that, although we based the dose of 400 Gy required by the interim rule on estimated minimum absorbed doses in the International Plant Protection Convention (IPPC) Guidelines for the Use of Irradiation as a Phytosanitary Measure (ISPM Publication No. 18), the research from which these estimated minimum absorbed doses were developed does not provide specific doses for neutralizing the ginger weevil or the sweetpotato stem borer. Both commenters requested that APHIS prohibit the treatment of sweetpotatoes moved interstate from Hawaii with irradiation until pest-specific research has been completed.

APHIS published a notice of policy titled "The Application of Irradiation to Phytosanitary Problems" in the **Federal Register** on May 15, 1996 (61 FR 24433-24439, Docket No. 95-088-1). In the section of that notice dealing with research protocols for determining appropriate doses and conditions for quarantine treatment, we stated that "In some instances, efficacy [of a minimum absorbed dosage] may be inferred from the literature for related species and commodities when complete laboratory investigations are not possible."

As we discussed in the interim rule, immediate action to allow the use of irradiation as an alternative treatment was warranted to alleviate the negative economic effects that Hawaiian growers and shippers faced as a result of our previous regulations, which identified fumigation as the only acceptable treatment for Hawaiian sweetpotatoes moved interstate. Fumigation facilities are unavailable on some islands in Hawaii on which sweetpotatoes are grown, and producers of sweetpotatoes on those islands must pay additional transportation costs for treatment before moving their sweetpotatoes interstate. Because a more accessible irradiation facility that provides the desired phytosanitary security was available to these producers, the requirement that sweetpotatoes must be fumigated to be moved interstate imposed an unnecessary economic hardship on these producers. Because we needed to take immediate action, we were not able to complete pest-specific research; therefore, in accordance with our notice of policy, we reviewed the available literature on related species and commodities to determine what dose would be effective at neutralizing the pests of concern.

The estimated minimum absorbed doses for certain responses for selected pest groups found in Appendix I of the IPPC guidelines were based on literature reviews by G.J. Hallman and the International Atomic Energy Agency's International Database on Insect Disinfestation and Sterilization (IDIDAS).<sup>1</sup> As discussed above, specific research has not been completed to determine the dose necessary to completely neutralize the ginger weevil, the sweetpotato scarabee, and the sweetpotato stem borer. However, the IDIDAS does cite a study indicating that a dose of 100 Gy (10 krad) is sufficient to induce 90 percent sterility in the sweetpotato scarabee.

The sweetpotato scarabee and the ginger weevil are stored product beetles classified under the order Coleoptera; the sweetpotato stem borer is a borer classified under the order Lepidoptera. The IDIDAS and the literature review by Hallman include references to studies of other pests of the order Coleoptera and other pests of the order Lepidoptera; the IPPC estimated minimum absorbed doses were derived from a general assessment of these references. The IPPC guidelines recommend a minimum absorbed dose of 50 to 400 Gy (5 to 40 krad) to sterilize actively reproducing adults of pests of the order Coleoptera and a minimum absorbed dose of 100 to

280 Gy (10 to 28 krad) to sterilize actively reproducing adults of pests of the order Lepidoptera. The dose of 400 Gy (40 krad) required by the interim rule is well above the IPPC guidelines' minimum dose range for borers of the order Lepidoptera and at the top of the minimum dose range for stored product beetles of the order Coleoptera. In our literature review, we determined that the ginger weevil, the sweetpotato scarabee, and the sweetpotato stem borer are biologically similar enough to other members of their respective orders, most of which are neutralized at doses well below 400 Gy (40 krad), that we believe that the 400 Gy (40 krad) dose required by the interim rule is a conservative minimum requirement that will be effective at neutralizing those three pests.

In addition, as we stated in the interim rule, preliminary research conducted by the USDA's Agricultural Research Service on the sweetpotato scarabee and the sweetpotato stem borer indicates that irradiating sweetpotatoes with a dose of 400 Gy (40 krad) kills all of these pests if they are present in the sweetpotatoes. According to this research, a dose of 250 to 300 Gy (25 to 30 krad) is sufficient to stop reproduction in these pests. (In the preamble of the interim rule, we incorrectly stated that the preliminary research mentioned here had found that a dose of 200 Gy [20 krad] was sufficient to stop reproduction in these pests; one commenter supplied us with the revised figure, and we have used it here.) Given this information, we continue to believe that the minimum dose of 400 Gy (40 krad) required by the interim rule is a conservative minimum requirement that will neutralize all three of the pests targeted by the treatment. We are making no changes in response to these comments.

One commenter noted that the preamble of the interim rule stated that requiring visual inspection for the gray pineapple mealybug and the Kona coffee root-knot nematode as a condition of the interstate movement of sweetpotato from Hawaii "is consistent with the recommendations of the pest risk assessment." The commenter also noted that the PRA states at one point that "Port of entry inspections appear insufficient to safeguard U.S. agriculture." The commenter believed that these statements were inconsistent.

The statement "Port of entry inspections appear insufficient to safeguard U.S. agriculture" can be found in the executive summary of the PRA; it refers to the overall pest risk presented by the interstate movement of sweetpotatoes from Hawaii before

<sup>1</sup> Available at <http://www-ididas.iaea.org>.

mitigations are applied and is not a characterization of any of the mitigation measures recommended in the PRA for any specific pests. The PRA found that the gray pineapple mealybug and the Kona coffee root-knot nematode have pest risk potential values of "medium" and "low," respectively. Pests with pest risk potential values of "low" typically do not require specific mitigation measures, while specific phytosanitary measures may be necessary for pests with values of "medium." Because the two pests in question are external pests, we believe they can be visually detected by inspectors. We are making no changes in response to this comment.

One commenter questioned the reliability of visual inspection for detecting whether the gray pineapple mealybug and the Kona coffee root-knot nematode are present on sweetpotatoes moved interstate from Hawaii.

We are confident that all inspectors have the training and skills necessary to visually detect these pests.

One commenter asked what safeguards were in place to prevent the escape of pests from Hawaiian sweetpotatoes moved interstate if the sweetpotatoes were moved to a facility within the continental United States for irradiation treatment.

The interim rule requires that sweetpotatoes moved interstate from Hawaii to a facility within the continental United States for irradiation treatment must be moved under limited permit. Any shipping containers of sweetpotatoes moved interstate from Hawaii to a facility within the continental United States for treatment must also be sealed. In addition, the sweetpotatoes must be visually inspected and found to be free of gray pineapple mealybug and the Kona coffee root-knot nematode before they are moved interstate from Hawaii for treatment. We believe these safeguards are adequate to prevent the escape of any pests that may be present prior to the irradiation of the sweetpotatoes. We are making no changes in response to this comment.

#### Economic Analysis

One commenter questioned the economic viability of Hawaiian sweetpotato production in the context of the interim rule. The commenter noted that the economic analysis in the interim rule gave the farm price of Hawaiian sweetpotatoes as 50 cents per cwt<sup>2</sup> for 2001, as reported by the Hawaiian Agricultural Statistical

Service, while the farm price of sweetpotatoes in the mainland United States averaged 17 cents per cwt in 2002. In addition, production per acre of Hawaiian sweetpotatoes was far less than sweetpotato production per acre in mainland States. Given the additional costs of treatment and transportation from Hawaii to the mainland United States, the commenter asked how Hawaiian sweetpotato growers could expect to make a profit by moving their crop interstate. This question, in the commenter's view, cast doubt on the wisdom of allowing irradiation to be used as an alternative to fumigation with methyl bromide as a treatment for sweetpotatoes moved interstate from Hawaii, as the use of irradiation as an alternate treatment increased the risk of pest introduction via sweetpotatoes moved interstate from Hawaii and would not benefit Hawaiian producers of sweetpotatoes, since they would be unable to compete with mainland producers.

The sweetpotatoes grown in Hawaii and intended for interstate movement are a special purple variety, known as the Okinawan sweetpotato. Because the sweetpotatoes produced in Hawaii are a specialty product, the prevailing price for the crops of Hawaiian sweetpotato growers may be different than that of the crops of mainland sweetpotato producers. We have clarified this point in the economic analysis in this affirmation of the interim rule. However, this information does not affect our conclusion that irradiation is an effective alternative treatment to fumigation with methyl bromide for sweetpotatoes moved interstate from Hawaii.

Two commenters expressed concern that allowing irradiation as an alternative to fumigation with methyl bromide for treatment of sweetpotatoes moving interstate from Hawaii might result in significant economic effects for producers of sweetpotatoes in the mainland United States. One stated that the opening of the market for sweetpotatoes in the mainland United States for sweetpotatoes from Hawaii would probably result in increased production in Hawaii, and that the increased production would compete directly with the sweetpotatoes produced in the mainland United States; thus, even though current production of Hawaiian sweetpotatoes would not have a significant impact on a substantial number of small entities, the commenter asserted that such an impact was possible in the future. The other commenter, in reference to our statement that "even if the irradiation treatment leads to increased production

of sweetpotatoes, sweetpotato shipments from Hawaii are unlikely to affect mainland producers negatively," asked how we had determined this, and further asked why we had not determined the elasticity of demand for sweetpotatoes before issuing the interim rule. The commenter also asserted that any amount of additional competition in the mainland market for sweetpotatoes is likely to have significant negative economic effects on mainland sweetpotato growers.

In the economic analysis in the interim rule, we stated that any increases in the volume of sweetpotatoes moved interstate from Hawaii due to the addition of irradiation as an alternative treatment would not significantly affect mainland sweetpotato producers because Hawaiian sweetpotato production is extremely small compared to total U.S. sweetpotato production. Hawaiian sweetpotato production in 2001, the last year for which State data are available, was 1.8 million pounds; total U.S. sweetpotato production in 2003 is estimated by the U.S. Department of Agriculture's Economic Research Service (ERS) to be 1.36 billion pounds. Producers have started new plantings of Hawaiian sweetpotatoes since the interim rule became effective and the irradiation treatment became available; however, even with these plantings, Hawaiian sweetpotato production will still be extremely small as a percentage of total U.S. sweetpotato production. In addition, as noted above, Hawaiian sweetpotatoes are intended for niche markets due to their special purple color. Thus, as long as sweetpotatoes moved interstate from Hawaii are treated in accordance with the regulations, there is no apparent reason for APHIS to expect these shipments to affect mainland producers negatively. Based on this evidence, we believe an extensive analysis of U.S. demand for sweetpotatoes is unnecessary.

Regarding the comment that the interim rule opened the mainland U.S. sweetpotato market to Hawaiian sweetpotatoes, we would like to emphasize that Hawaiian sweetpotatoes had previously been allowed to move interstate after fumigation with methyl bromide. The interim rule simply provided that irradiation could be used as an alternative to fumigation.

In the economic analysis in the interim rule, we cited statistics indicating that domestic sweetpotato production grew 15 percent between 1989–1991 and 1999–2001. Two commenters stated that this statistic could be misleading. One pointed out that per capita potato consumption has

<sup>2</sup> "cwt" is an abbreviation for "hundredweight," a commonly used unit of production for sweetpotatoes. One hundredweight equals 100 pounds.

remained flat since 1989–1991 at 4.1 pounds per person, according to ERS. The other asserted that sweetpotato production has become essentially cyclical in the last 30 years, as rising prices lead to increased production, which leads to falling prices, which lead in turn to less production.

The statistics we cited in the interim rule referred to production, and not to consumption; they were cited to provide background on U.S. sweetpotato production. We stated in the economic analysis in the interim rule that sweetpotato production had peaked in 1932 and then demonstrated a long-term downward trend. However, analysis of the time series data shows that—though the long-term trend has been declining, and production fluctuated from year to year—an increasing trend in sweetpotato production has prevailed since 1989.

Responding to the statement in the interim rule's economic analysis that the total volume of sweetpotatoes moved interstate from Hawaii was not likely to exceed 100 containers due to production limitations, one commenter asked us to express that amount in pounds.

A typical shipping container used to transport Hawaiian sweetpotatoes can hold about 24,000 pounds of sweetpotatoes, so the total volume of sweetpotatoes moved interstate from Hawaii each year would not be likely to exceed 2.4 million pounds, even if Hawaii were to produce its maximum possible volume of sweetpotatoes. As noted earlier, current yearly Hawaiian sweetpotato production is 1.8 million pounds.

Approximately 30,000 to 40,000 pounds of sweetpotatoes are now moved interstate from Hawaii to the mainland United States per week, although these shipments have occurred during the low season and industry representatives expect their volume to increase. We have added this information to the economic analysis in this affirmation of the interim rule.

One commenter asked several questions about the capacity of the irradiation facility currently operating in Hawaii to treat sweetpotatoes to be moved interstate from Hawaii.

Because this capacity will vary according to the number of individual shipments treated in the facility and the number of pallets of sweetpotatoes per shipment, we cannot provide a definite answer. Extensive data on the volume of sweetpotatoes treated at the Hawaiian facility are not yet available to us and will only be generated as the operation of the facility continues.

Regarding the two points discussed above, one commenter was confused as to whether the limitations on Hawaii's production capacity relate to the fact that if the capacity of the irradiation facility currently operating in Hawaii is not enough to treat all the sweetpotatoes producers and shippers wish to move interstate, sweetpotatoes may be shipped to mainland irradiation facilities for treatment.

These two capacities are independent. If sweetpotatoes cannot be irradiated at the irradiation facility currently operating in Hawaii, they must be irradiated on the mainland or fumigated with methyl bromide in order to be eligible to move interstate.

One commenter asked whether production of Hawaiian sweetpotatoes is seasonal.

Hawaiian sweetpotatoes are produced and moved interstate throughout the year, but there is some seasonal variation in volume, according to industry representatives; production during the high season can be about three times the production during the low season. We have added this information to the economic analysis in this affirmation of the interim rule.

One commenter noted that, under some circumstances, fumigation with methyl bromide could be less expensive than irradiation treatment for sweetpotatoes moved interstate from Hawaii. The commenter asked how we could know that Hawaiian sweetpotato producers and shippers would use irradiation treatment and what percentage of the Hawaiian sweetpotato crop we would expect to be irradiated.

The interim rule provided Hawaiian sweetpotato producers and shippers with an additional option for treating their product prior to moving it interstate; these producers and shippers are free to choose the alternative they prefer. As stated in the economic analysis, the fumigation of larger volumes of sweetpotatoes may, at some volumes, be performed at a lower per-unit cost than irradiation. However, irradiation can be performed at a more convenient location for some producers and eliminates the costs associated with transport between islands and overtime costs for APHIS monitoring of the fumigation process. It is also possible that the economic attractiveness of the irradiation option might increase in the future, since the supply of methyl bromide will diminish in the future due to the requirements of the Montreal Protocol, and the cost of fumigation is expected to increase accordingly. As discussed above, however, extensive data on the volume of sweetpotatoes treated at the Hawaiian facility are not

yet available to us and will only be generated as the operation of the facility continues.

One commenter asked why Hawaii could not simply consume its own sweetpotato production, rather than moving sweetpotatoes interstate to the mainland United States.

APHIS has no authority over the movement of goods in interstate commerce except when such movement poses a plant or animal health risk. Hawaiian sweetpotato producers and shippers wish to move their sweetpotatoes interstate, and the interim rule provided an alternate treatment that gave those producers and shippers more options for interstate movement.

For one commenter, the interim rule appeared to be a deliberate attempt to benefit Hawaiian sweetpotato growers at the expense of mainland sweetpotato growers. The commenter cited in particular the statement in the economic analysis of the interim rule that providing the alternative irradiation treatment "may lead to increased production of sweetpotatoes in Hawaii if the lower cost of treatment makes sweetpotato a more profitable crop to produce and ship." The commenter took from this statement an implication that Hawaiian sweetpotato was already profitable and that APHIS was seeking to make it more profitable, and was concerned that a rule designed to make one production area more profitable than others within the United States would be unfair.

APHIS establishes regulations to address animal and plant health risks. Of all the States, only sweetpotatoes grown in Hawaii, Puerto Rico, and the U.S. Virgin Islands are required to be treated prior to interstate movement. Allowing irradiation to be used as an alternative to methyl bromide for treatment of sweetpotatoes moved interstate from Hawaii was not intended to favor producers in Hawaii over producers in other States, but rather to provide Hawaiian producers with another means of complying with the interstate movement restrictions they face.

One commenter asked whether the economic benefits gained by the irradiation treatment facility currently operating in Hawaii were our motivation for allowing irradiation to be used to treat sweetpotatoes moving interstate from Hawaii.

We stated our motivation for allowing irradiation as an alternate treatment in the interim rule under the heading "Immediate Action." Immediate action was warranted to alleviate the negative economic effects that Hawaiian growers and shippers faced as a result of our

previous regulations, which required fumigation as the only acceptable treatment for Hawaiian sweetpotatoes moved interstate. Fumigation facilities are unavailable on some islands in Hawaii on which sweetpotatoes are grown, and producers of sweetpotatoes on those islands must pay additional transportation costs for treatment before moving their sweetpotatoes interstate. Because a more accessible irradiation facility that provides the desired phytosanitary security was available to these producers, the requirement that sweetpotatoes must be fumigated to be moved interstate imposed an unnecessary economic hardship on these producers. The interim rule made irradiation treatment available to those producers.

One commenter supplied us with more current data on the operations of the irradiation treatment facility currently operating in Hawaii:

- We stated in the interim rule's economic analysis that the irradiation facility is used to treat bell peppers, eggplants, mangoes, papayas, pineapples (other than smooth Cayenne), Italian squash, and tomatoes. Although the regulations allow irradiation to be used as a treatment for bell peppers, eggplants, pineapples, Italian squash, and tomatoes to be moved interstate from Hawaii, the irradiation facility is currently not being used to treat these commodities. However, the facility is treating atemoya, carambola, litchi, longan, and rambutan.

- We also stated in the interim rule's economic analysis that some Hawaiian fruits and vegetables are sometimes shipped to irradiation facilities in the mainland United States for treatment. The commenter stated that all the produce for which irradiation is an approved treatment is currently treated in Hawaii before it is moved interstate. We have updated the economic analysis accordingly.

Therefore, for the reasons given in the interim rule and in this document, we are adopting the interim rule as a final rule without change.

This action also affirms the information contained in the interim rule concerning Executive Orders 12866, 12372, and 12988 and the Paperwork Reduction Act.

Further, for this action, the Office of Management and Budget has waived its review under Executive Order 12866.

**Regulatory Flexibility Act**

This rule affirms an interim rule that amended the regulations to provide for the use of irradiation as a treatment for sweetpotatoes to be moved interstate

from Hawaii. The interim rule also provided that the sweetpotatoes have to meet certain additional requirements, including inspection and packaging requirements. The interim rule provided for the use of irradiation as an alternative to methyl bromide for the treatment of sweetpotatoes moving interstate from Hawaii.

The following analysis addresses the economic effect of this rule on small entities, as required by the Regulatory Flexibility Act.

**Economic Importance of Sweetpotatoes in Hawaii and the Mainland United States**

Commercial sweetpotato production in Hawaii occurs on the islands of Hawaii, Kauai, Maui, and Oahu. There were 53 sweetpotato farms in Hawaii in 1997.<sup>3</sup> In 2001, the production of sweetpotatoes in Hawaii amounted to 1.8 million pounds, and the value of sales of these sweetpotatoes was \$900,000 (table 1). The sweetpotatoes intended for interstate movement are of a special purple flesh variety known as the Okinawan sweetpotato. The crop is in year-round production in Hawaii.

TABLE 1.—PRODUCTION STATISTICS FOR HAWAIIAN SWEETPOTATOES (2001)

Item	Amount
Harvested acres .....	220
Yield per acre (1,000 pounds) ....	8.2
Production (1,000 pounds) .....	1,800
Farm price (cents per pound) .....	50
Value of sales (1,000 dollars) ....	900

Source: Hawaii Agricultural Statistics Service.

In the continental United States, sweetpotato is grown commercially in Alabama, California, Georgia, Louisiana, Mississippi, New Jersey, North Carolina, South Carolina, Texas, and Virginia.<sup>4</sup> North Carolina, Louisiana, Mississippi, and California account for the major proportion of production area by State (table 2). In total, the United States produced 1.36 billion pounds of sweetpotatoes from 93,500 acres in 2003 (table 3).

TABLE 2.—ACRES OF SWEETPOTATOES PLANTED IN THE UNITED STATES (2003)

State	Acres planted
North Carolina .....	42,000

<sup>3</sup> Census of Agriculture, 1997, National Agricultural Statistics Service (NASS).

<sup>4</sup> NASS, 1999.

TABLE 2.—ACRES OF SWEETPOTATOES PLANTED IN THE UNITED STATES (2003)—Continued

State	Acres planted
Louisiana .....	18,000
Mississippi .....	14,000
California .....	10,100
Texas .....	3,400
Alabama .....	2,900
Others <sup>1</sup> .....	3,100
Total .....	93,500

<sup>1</sup> Including Hawaii. Source: Economic Research Service, USDA.

The crop is grown on 1,770 farms, which represents a decrease of 44 percent since 1987.<sup>5</sup> Production of sweetpotatoes peaked in 1932 when 48 million cwt was generated, followed by a long-term downward trend in production. However, sweetpotato production trended higher again after 1988, and increased by 15 percent between 1989–1991 and 1999–2001. Farm cash receipts averaged \$214 million over the period 1999–2001. Few imports of sweetpotatoes enter the continental United States, with 97 percent of the import volume moving directly from the Dominican Republic into Puerto Rico. The Hawaiian sweetpotato production of 1.8 million pounds thus comprises a fairly minor proportion of the total production of 1.36 billion pounds in the United States.

TABLE 3.—PRODUCTION AND UTILIZATION STATISTICS FOR SWEETPOTATOES IN THE UNITED STATES (2003)<sup>1</sup>

Item	Amount
Acres planted .....	93,500
Three year average yield (cwt/acre) .....	150
Production (million pounds) .....	1,355
Imports (million pounds) .....	17.0
Exports (million pounds) .....	53.0
Total utilization (million pounds) <sup>2</sup> .....	1,148.3
Per capita use (pounds) .....	3.9
Three year average per capita use (pounds) .....	4.0
Current dollars (\$/cwt) .....	15.75
Constant 1996 dollars (\$/cwt) .....	13.91

<sup>1</sup> Estimates are for the total United States, and therefore include Hawaii. Forecasted estimates are shown.

<sup>2</sup> Total utilization includes 103 million pounds used for seed and 67.8 million pounds accruing to feed use, shrink, and loss.

<sup>5</sup> Lucier, G. "Sweet potatoes—getting to the root of demand." Economic Research Service, USDA, 2002.

Source: Economic Research Service, United States Department of Agriculture. Acres were obtained from Lucier.<sup>6</sup>

More than three-quarters of the annual U.S. sweetpotato crop is sold as human food, and around two-thirds of the total sales are for the fresh market. About a quarter of the sweetpotatoes sold for food are processed into frozen products, and 2 to 3 percent are chipped or dehydrated. U.S. sweetpotato utilization averaged 1.1 billion pounds during 1999–2001, accounting for almost 3.9 pounds per capita.

**Treatment Costs**

*Costs of Methyl Bromide Fumigation*

Methyl bromide fumigation is currently conducted on the Island of Oahu. The product has to be moved by barge from the port of Hilo on the Island of Hawaii to the port of Honolulu on Oahu. The charge for such transportation is between 2 to 3 cents per pound. A pallet of sweetpotatoes weighs 1,500 pounds (50 30-pound boxes), so the charge is approximately \$35 per pallet for a non-chilled shipment. Trucking and handling charges to move the sweetpotatoes from the pier on Oahu to the fumigation site and, after fumigation, back to the pier or to the airport are estimated at \$34 per pallet.

The per-unit cost of methyl bromide fumigation is influenced by the number of pallets treated. Costs are \$610 for 1 to 6 pallets, \$1,026 for 7 to 9, and \$1,250 for 10 to 12. The minimum charge is \$610. Per-unit cost thus decreases as more pallets are treated within these ranges. For example, the cost decreases from 40.6 cents per pound to 6.7 cents per pound if six pallets instead of only one pallet are treated at \$610 (table 4).

TABLE 4.—COSTS OF METHYL BROMIDE FUMIGATION OF HAWAIIAN SWEETPOTATOES

Number of pallets	Weight (pounds)	Cost (cents per pound)
One .....	1,500	40.6
Two .....	3,000	20.3
Three .....	4,500	13.5
Four .....	6,000	10.1
Five .....	7,500	8.1
Six .....	9,000	6.7
Nine .....	13,500	7.6
Twelve .....	18,000	6.9

Source: Hawaii Department of Agriculture.

APHIS monitoring of the treatment costs \$368 per treatment. This is based on a minimum of 2 hours required to set up for the fumigation, a minimum of 2

hours for necessary after-treatment labor such as certification, and 2 hours minimum travel time each way to monitor the fumigation. The total 8 hours at \$46 per hour amounts to \$368. Due to the time delays involved in inter-island movements of sweetpotatoes, all fumigations are conducted after 4 p.m. or on weekends, which means that APHIS treatment monitors are paid “time-and-a-half” wages. If the sweetpotatoes being treated belong to more than one shipper, the APHIS costs are evenly divided between the shippers, regardless of the relative quantities treated for each shipper. For example, if two shippers are involved, each would pay \$184, even if one shipper’s sweetpotatoes comprised more than half of the total treated. APHIS monitoring costs for fumigation do not vary with the number of sweetpotatoes treated.

Various time delays are involved in the inter-island movement of the sweetpotatoes for fumigation, meaning that this transportation is sometimes problematic. Shipments from the main island, Hawaii, generally leave Hilo on Monday, with the barge arriving at Oahu on Wednesday. These shipments are treated on Wednesday or Thursday and arrive by Friday on the mainland U.S. west coast if transported by air. The barge that leaves Hilo on Thursday arrives at Oahu on Saturday. Weekend fumigation is conducted at significantly higher costs and Sunday pickup at the pier is not allowed. Thus, shipping sweetpotatoes on the Thursday barge is generally avoided.<sup>7</sup>

There are also concerns regarding the future cost and availability of methyl bromide given the continuing reductions in the use of methyl bromide mandated by the Montreal Protocol, which governs the use of substances that deplete stratospheric ozone; in 2005, all uses of methyl bromide in developed countries other than quarantine and pre-shipment applications and critical or emergency uses will be prohibited. The price of methyl bromide has increased significantly as worldwide production of methyl bromide has decreased from its 1991 baseline. According to the U.S. Environmental Protection Agency, U.S. west coast end-user prices of methyl bromide have increased from \$1.25 per pound to \$4.50 per pound over the period 1995 to 2001. This represents an increase of 366 percent. Further price increases are deemed likely as the 2005 phase-out date approaches.

*Costs of Irradiation*

The cost of irradiation is estimated at 15 cents per pound.<sup>8</sup> Lot sizes will be as requested by shippers. Irradiation treatment generally occurs between 8 a.m. and 4 p.m. At these times, an APHIS inspector would already be onsite at the irradiation facility to monitor the treatment under the terms of the compliance agreement irradiation facilities must operate under in order to treat fruits and vegetables from Hawaii for interstate movement. Therefore, there would generally be no additional APHIS charges associated with irradiation treatment. Shippers could choose to have their sweetpotatoes treated outside of normal hours and thus incur APHIS charges for overtime labor, but such scheduling would be optional; as noted above, all fumigation treatments currently must be conducted during overtime hours.

The irradiation will occur mostly at an existing facility in Hawaii, prior to the shipment of the sweetpotatoes to the mainland United States. The X-ray irradiation facility in Hawaii commenced its commercial operation on August 1, 2000. At first, only papayas were treated. Five hundred to 1,000 boxes of papayas are treated per day, 4 times a week. The facility is currently also used to treat other Hawaiian fruits and vegetables for which irradiation is an approved treatment. At present, all of the fruits and vegetables produced in Hawaii for which irradiation is an approved treatment are irradiated in Hawaii before they are moved interstate.

The Hawaiian sweetpotatoes intended for the U.S. mainland markets are of a special purple flesh variety. The crop therefore comprises a specialty product intended for niche markets. The sweetpotatoes are in year-round production in Hawaii, but some seasonal variation in volume is expected. Out-shipment of the sweetpotatoes has been estimated at 50,000 to 60,000 pounds per week, and an estimated 30,000 to 40,000 pounds per week has been shipped since the interim rule was published. However, these weekly shipments occurred during the low season, and industry representatives expect the shipments to increase. New plantings of the crop have also commenced since the irradiation treatment became available.

*Benefits of Irradiation Treatment*

The approval of irradiation as an alternative treatment for sweetpotatoes moved interstate from Hawaii will

<sup>6</sup>Lucier, G., *ibid.*

<sup>7</sup>Source: Hawaii Department of Agriculture.

<sup>8</sup>Source: Hawaii Department of Agriculture.

benefit various stakeholders. At 15 cents per pound, irradiation can be conducted at a lower cost than fumigation of one to two pallets (20.3 to 40.6 cents per pound) (table 4). Though larger quantities of sweetpotatoes, which fill more pallets, can be fumigated at lower per-unit costs (6.7 to 13.5 cents per pound), irradiation eliminates the transport costs associated with fumigation for producers on the island of Hawaii. These transport costs include moving the crop from the island of Hawaii to Oahu (2 to 3 cents per pound) and trucking and handling costs of moving the crop between the harbor or airport and the fumigation site on Oahu (\$34 per pallet, about 2.3 cents per pound). Irradiation also eliminates the cost of \$368 per treatment attributable to APHIS monitoring of fumigation, which is currently conducted outside standard business hours, for all producers.

Growers and shippers on the main island of Hawaii will benefit from lower transportation costs, since shipment of the crop from Hawaii to Oahu for fumigation will no longer be necessary. The availability of treatment at a more convenient location will also remove various logistical complications. This will reduce the total expense and time delay in moving the product and will enable sweetpotatoes to be treated and shipped at a lower cost than is currently possible with fumigation. The importance of alternative treatments is especially highlighted in view of the mandated global reductions in the use of methyl bromide under the Montreal Protocol. Irradiation also tends to affect quality less negatively than fumigation and may extend the shelf life of the tubers.

The irradiation facility in Hawaii will benefit from having more crops available to treat. The treatment available at this facility has enabled many producers in Hawaii to move their products to the mainland, thus providing them with access to markets that were not previously available. For several years, the State of Hawaii has encouraged farmers to diversify agricultural production, given the significant decline in the production of sugarcane as a major crop. The approval of irradiation as a treatment for sweetpotatoes moved interstate from Hawaii will help to provide steady throughput for this facility. The facility currently treats seasonal crops whose volume is more variable than that of sweetpotatoes and is thus sometimes underutilized. A steady source of revenues from treatment, such as revenues from treating sweetpotatoes to be moved interstate, would help assure this facility's continued operation and

availability for all the producers in Hawaii who can use it.

U.S. mainland consumers will benefit by an increased supply of sweetpotatoes, and particularly the increased availability of the specialty purple sweetpotatoes Hawaii produces. Hawaiian sweetpotato production amounts to 1.8 million pounds, which comprises a small proportion of the total production of 1.36 billion pounds in the United States (tables 1, 2 and 3).

Thus, as long as phytosanitary protection is maintained by treating sweetpotatoes from Hawaii prior to interstate movement, sweetpotato shipments from Hawaii are unlikely to affect mainland producers negatively, even if the availability of the irradiation treatment leads to further increases in the production of Hawaiian sweetpotatoes. Furthermore, the purple sweetpotatoes Hawaii produces are intended for niche markets in the mainland United States. However, to the extent that this interim rule makes moving sweetpotatoes from Hawaii interstate more convenient and less costly, the rule provides the Hawaiian sweetpotato industry with opportunities to expand the mainland markets for its specialty product.

#### Impact on Small Entities

The Regulatory Flexibility Act requires that agencies specifically consider the economic impact of their regulations on small entities. The Small Business Administration (SBA) has established size criteria using the North American Industry Classification System (NAICS) to determine which economic entities meet the definition of a small firm.

The irradiation facility in Hawaii is expected to be the primary facility to treat Hawaiian sweetpotatoes before they are moved interstate. However, the sweetpotatoes may also be sent to one of the three other facilities on the mainland United States. These include facilities in Libertyville and Morton Grove in Illinois, and a facility in Whippany, New Jersey. The facility in Hawaii can be classified under NAICS category 115114, "Postharvest Crop Activities (except Cotton Ginning)." According to the SBA's criteria, this facility is classified as a small entity, since its annual sales are less than \$6 million. A single firm owns the two facilities in Illinois and the facility in New Jersey. Its primary service is to provide irradiation treatment for the sanitation of medical devices on contract. This firm is classified under NAICS category 325612, "Polish and Other Sanitation Good Manufacturing." However, since it is part of a larger

corporation with 500 or more employees, that firm is not considered a small entity under the SBA's criteria.

Sweet potato farming is classified under NAICS 111219, "Other Vegetables (except Potato) and Melon Farming." According to the SBA's criteria, an entity involved in crop production is considered small if it has average annual receipts of less than \$750,000. Since the 53 sweetpotato farms in Hawaii accounted for sales of \$900,000 in 2001, we believe it is safe to assume that all of these farms would be classified as small entities. We expect that the economic effects of this rule will be positive for those producers, to the extent that this rule makes moving sweetpotatoes from Hawaii interstate more convenient and less costly.

As discussed above, new sweetpotato plantings in Hawaii have commenced since the interim rule became effective. Nevertheless, even if sweetpotato production increases in Hawaii, the relative volume of production (1.8 million pounds) remains minimal in comparison to the volume of U.S. mainland production (1.36 billion pounds). The purple-fleshed Hawaiian sweetpotatoes furthermore are a specialty product intended for niche markets. Thus, as long as phytosanitary protection is maintained by treating sweetpotatoes from Hawaii prior to interstate movement, sweetpotato shipments from Hawaii are unlikely to affect mainland producers negatively.

Under these circumstances, the Administrator of the Animal and Plant Health Inspection Service has determined that this action will not have a significant economic impact on a substantial number of small entities.

#### List of Subjects in 7 CFR Part 318

Cotton, Cottonseeds, Fruits, Guam, Hawaii, Plant diseases and pests, Puerto Rico, Quarantine, Transportation, Vegetables, Virgin Islands.

#### PART 318—HAWAIIAN AND TERRITORIAL QUARANTINE NOTICES

■ Accordingly, we are adopting as a final rule, without change, the interim rule that amended 7 CFR part 318 and that was published at 68 FR 37931–37936 on June 26, 2003.

**Authority:** 7 U.S.C. 7701–7772; 7 CFR 2.22, 2.80, and 371.3.

Done in Washington, DC, this 11th day of February, 2004.

**Kevin Shea,**

*Acting Administrator, Animal and Plant Health Inspection Service.*

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