

## Historical Economic Impact Estimates of New World Screwworm in the United States

### 1930 – 1940s

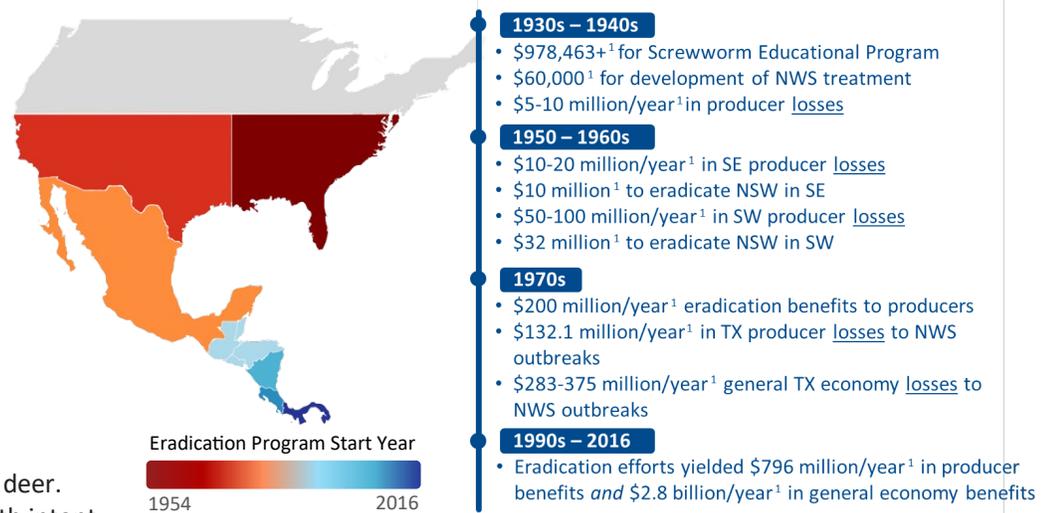
Though New World Screwworm (NWS) was present in the southwestern United States (map below) since at least 1842, the pest was first documented as a significant problem in the Southeast in 1933, following shipments of infested animals from the Southwest. In response to the rapidly expanding NWS affected areas, the U.S. Department of Agriculture (USDA) and southeastern States engaged in the Screwworm Educational Program in 1935 to instruct producers on how to prevent livestock infestations. The Federal government and the State of Florida committed \$978,463<sup>1</sup> to this program over nearly 3 years, in addition to undocumented contributions from other States. In 1941, USDA announced the success of a \$60,000<sup>1</sup> program to develop Smear 62, a targeted NWS insecticide, aimed at reducing producer losses, which were estimated at \$5-10 million<sup>1</sup> annually, nationwide. During these decades, USDA scientists developed a technique to mass-produce NWS and sought methods to sterilize the flies, preventing reproduction.

### 1950 – 1960s

Radiation was identified as an effective way to sterilize NWS flies, leading to the establishment of the first test site in Florida in fall 1951. Experiments in the early 1950's confirmed the success of the **Sterile Insect Technique (SIT)**. Producers in the southeastern United States experienced losses up to \$10–20 million<sup>1</sup> per year prior to NWS eradication in 1959. This eradication was the result of over a year of SIT and an investment of \$10 million<sup>1</sup> from the Federal government and State of Florida. At this time, producers in the southwestern United States lost between \$50–100 million<sup>1</sup> annually due to NWS. Presumably, these higher losses in the Southwest were due to higher livestock populations, larger geographic area, and/or greater potential for NWS to overwinter. The success of the eradication program in the Southeast led to the initiation of an eradication program for the Southwest in 1962. Funded by the Federal government, States in the Southwest Eradication Area (Texas, New Mexico, Arkansas, Louisiana, and Oklahoma), and the Southwest Animal Health Research Foundation (a rancher-led nonprofit), this eradication program was declared a success in 1966. It ultimately cost \$32 million<sup>1</sup> to complete, establishing an NWS barrier zone along the U.S./Mexico border.

### 1970 – 2020s

By the mid-1970s, the estimated economic benefit of NWS eradication programs to U.S. producers was \$200 million<sup>1</sup> per year. However, the continued presence of NWS in Mexico resulted in recurrent outbreaks in the Southwest. An analysis of NWS economic impacts in Texas in 1976 indicated that livestock producers spent \$132.1 million<sup>1</sup> per year to manage NWS outbreaks, with a total impact to the Texan economy of \$283–375 million<sup>1</sup>. The difficulty of maintaining the barrier zone along the U.S./ Mexico border and the impact of these outbreaks led to the creation of the Joint Mexico-U.S. Screwworm Eradication Commission to drive NWS to Mexico's southern borders, which was achieved in 1986. In 2016, NWS re-emerged in the Florida Keys, affecting endangered Key deer. Officials quickly released sterile flies with intent to control the outbreak, and by early 2017, NWS had been successfully eradicated.



### Economic Benefits of U.S. Eradication

The eradication of NWS in the United States yielded annual economic benefits to producers estimated at \$796 million<sup>1</sup> in 1996, with an estimated \$2.8 billion<sup>1</sup> benefit to the wider economy.

<sup>1</sup> Figure is not adjusted for inflation

### Costs Associated with NWS Infestation

Before eradication, producers experienced significant losses due to NWS, including costs from the following:

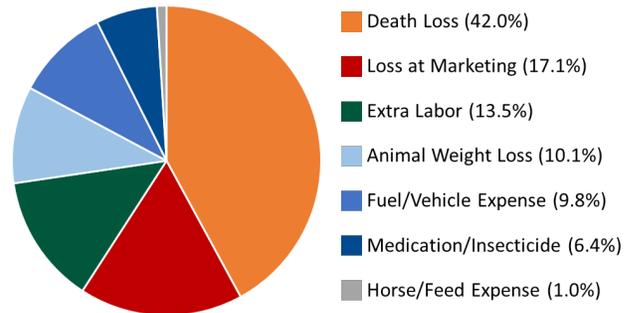
- Animal deaths
- Decreased livestock production
- Decreased availability of draught animals and manure
- Increased need for veterinary services
- Increased need for medication and insecticide
- Extra labor and vehicle costs for the inspection and treatment of infested animals.

Costs of response activities, paid for by States, the Federal government, and nonprofits, included:

- Public education
- Research for more effective treatments
- Surveillance activities
- SIT expenditures

### Example Breakdown of Producer Costs

An analysis of producer costs due to an NWS outbreak in Texas in 1976 indicated that producers spent \$132.1 million<sup>1</sup> that year in response to the pest, with the total cost broken down into the following categories:

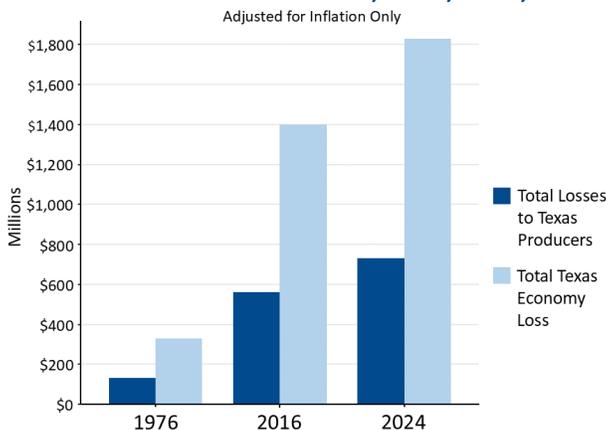


### Potential Economic Impact of NWS in 2024

Despite the maintenance of a barrier zone along the U.S.-Mexico border after the eradication of NWS in the United States in 1966, southwestern States experienced recurrent Mexican-origin NWS outbreaks. Along with vigilant surveillance and prompt isolation and treatment of infested animals, outbreaks were managed using SIT until the barrier zone moved south of the U.S.-Mexico border. An economic analysis<sup>2</sup> of the 1976 NWS outbreak in Texas indicated that 1,488,256 cattle and 332,600 sheep and goats were infested with NWS that year. Assuming equivalent livestock populations and NWS infection rates as in the case study in 1976 Texas, the total cost per NWS case was adjusted for inflation to 2016 and 2024 dollars. The table to the right shows the livestock populations, NWS infestation rates, and costs included in this calculation.

| NWS Losses:<br>Texas Data     | 1976 Results                  | 2016 Results           | 2024 Results           |
|-------------------------------|-------------------------------|------------------------|------------------------|
|                               | (Adjusted for inflation only) |                        |                        |
| Cattle Population             | 7,224,515                     | -                      | -                      |
| Cattle Infestation Rate       | 20.60%                        | -                      | -                      |
| Cattle Cost/Case              | \$81.51                       | \$346.28               | \$452.14               |
| Sheep & Goat Population       | 3,654,945                     | -                      | -                      |
| Sheep & Goat Infest. Rate     | 9.10%                         | -                      | -                      |
| Sheep & Goat Cost/Case        | \$32.38                       | \$137.56               | \$179.61               |
| Total Cattle Cost             | \$121,307,258                 | \$515,351,210          | \$672,897,355          |
| Total Sheep & Goat Cost       | \$10,769,588                  | \$45,752,456           | \$59,738,286           |
| <b>Texas Producers Losses</b> | <b>\$132,076,846</b>          | <b>\$561,103,666</b>   | <b>\$732,635,641</b>   |
| <b>Texas Economy Loss</b>     | <b>\$329,598,005</b>          | <b>\$1,400,235,237</b> | <b>\$1,828,293,838</b> |

### Estimated NWS Losses in Texas, 1976, 2016, & 2024



The results of adjusting for inflation indicate that an NWS outbreak roughly the scale of the 1976 outbreak could cost Texas producers \$732 million per year and the Texas economy a loss of \$1.8 billion. Numerous factors make this comparison, over 40 years after NWS eradication, difficult. Texas' cattle population in 2024 is significantly larger (12 million), while the sheep and goat populations are lower (655 thousand). There are a multitude of other factors that could affect the economic impact of NWS in 2024 and require further quantification, including husbandry and veterinary practices, economic output multipliers, costs of response activities, and potential NWS infection rates. **The results of this analysis demonstrate the potential of NWS infestations in the United States to have a significant economic impact.**

<sup>1</sup> Figure is not adjusted for inflation

<sup>2</sup> Thomas, J.G. (1978). 1977 Screwworm Program in Texas: "Mission 77 - Stamp Out Screwworms." USDA National Agricultural Library Special Collections. Retrieved from <https://www.nal.usda.gov/exhibits/speccoll/items/show/7228>