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Marketing and Regulatory Programs

Animal and Plant Health Inspection Service

Emerald Ash Borer Cooperative Eradication Program

Lucas County, Ohio

Environmental Assessment, April 2003

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I. Need for Proposal

A. Introduction

The emerald ash borer, *Agrilus planipennis* Fairmaire, is an exotic new insect and has been recently discovered in North America and belongs to a group known as wood-boring beetles. It is indigenous to Asia and is known to occur in China, Korea, Japan, Mongolia, the Russian Far East and Taiwan. This destructive borer's host range is limited to species of ash trees (Fraxinus spp.) and is only known to attack green, white, and black ash trees and some varieties of horticultural ash. The emerald ash borer does not attack mountain ash, which is not related to the other ash species. Managed and natural stands of ash are at risk from infestations of emerald ash borer.

The U.S. Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS), is proposing a program to quarantine and apply chemical treatments for the control and eradication of the emerald ash borer, *Agrilus planipennis* Fairmaire, in Lucas County, Ohio. This program is necessary to enhance program operations to reduce the potential for damage from this major pest of ash trees. The emerald ash borer destroys healthy trees by boring beneath their bark, disrupting their vascular tissue, and eventually killing them. Very little information on the beetle is available from its native region, and limited control or management recommendations exist to date. This destructive new insect has been recently discovered in six Southeast Michigan counties and also found in Windsor, Ontario in Canada. This nonnative pest has the potential to spread to other areas of the United States and cause extensive losses to ornamental and commercial ash tree species. The beetle has most recently been detected in a rural area near Whitehouse in Lucas County, Ohio. This area is also known as the Oak Openings Metro Region. This exotic insect pest ultimately may be found in other areas as well.

Under APHIS' National Environmental Policy Act Implementing Procedures, 7 Code of Federal Regulations (CFR) Part 372, the proposed action is a class of action for which an environmental assessment (EA) is normally prepared. This EA considers the potential effects of the proposed action and its alternatives, including no action.

North America has abundant forest resources. Most logs and lumber imported into the United States have historically been limited to those from the forests of Canada. Increased trade has resulted in more frequent and greater quantities of logs and lumber (including solid wood packing materials (SWPM)) entering the United States from other parts of the world. Various plant pests, such as the Asian longhorned beetle and the emerald ash borer (a new wood boring insect with similar actions) from China, can occur on or in these unfinished wood products. Protection of the forest resources of the United States from damage by foreign pest species is part of the mission of the U.S. Department of Agriculture, Animal and Plant Health Inspection Service (APHIS). Exclusion of those pest species is the most effective method of preventing the losses associated with new pest infestations.

B. Purpose and Need

Increased trade and the resultant increased opportunities for invasion by alien agricultural pests have placed the United States and its agricultural economies at substantially increased risk in recent years. In particular, a number of infestations and interceptions of exotic forest wood boring insects have been associated with SWPM from the People's Republic of China. Outbreaks of the Asian longhorned beetle (*Anoplophora glabripennis*), a destructive pest of maple and other hardwoods, were first detected in New York in 1996 and in Chicago, Illinois, in 1998. In addition, four genera of wood borers (*Anoplophora, Ceresium, Hesperophanes, and Monochamus*) have been intercepted in shipments from China that were delivered to warehouses in 11 other States. The emerald ash borer is closely associated with Asian longhorned beetle and is thought to have arrived in the United States in much the same way as with commercial trade.

APHIS has responsibility for taking actions to exclude, eradicate, and/or control plant pests, including the emerald ash borer, under the Plant Protection Act (7 United States Code (U.S.C.) 7701 *et seq.*). APHIS has been delegated the authority to administer these statutes and has promulgated Quarantines and Regulations (7 CFR 319) which regulate the importation of commodities and means of conveyance.

The current exclusion and eradication program consists of various regulations designed to require treatment of SWPM from China and eliminate the Asian longhorned beetle. Not much is known at this time regarding the emerald ash borer. To help effectively control and eradicate the emerald ash borer and the threat it poses to North America ash resources, aggressive and comprehensive research projects are underway to learn more about this pest's biology and develop appropriate management, control, and eradication options. The underlying strategy is to contain the pest by reducing population density and spread along the leading edge or managing distinct zones of infestation. The Asian longhorned beetle program has proven to be effective at preventing new infestations from wood products imported from China and should be similarly effective against the emerald ash borer. Other methods, such as removal and destruction of infested host trees, are expensive. Effective elimination of the beetle by removal of infested host plants depends upon early detection and timely identification of infestations in trees and cuttings before the beetle can spread to nearby host plants. Small infestations that are detected early may be eradicated easily, but several small infestations in a localized area may become more difficult to eliminate. Therefore, in addition to cutting and removal of infested trees, the program also can employ chemical methods to prevent infestation of healthy trees from adult beetles in the vicinity of presently infested areas. Field tests for several treatments have been conducted in China that indicate that the chemical treatments are suitable for cost-effective use in control of the beetle in the United States. There are also 3 years of supporting data from the United States suggesting chemical treatment is effective.

This site-specific EA has been prepared in compliance with the National Environmental Policy Act of 1969 (42 U.S.C. 4321–4327 (NEPA)) and its implementing regulations. In this site-specific EA, APHIS proposes, in response to this infestation of emerald ash borer in Lucas County, Ohio, an emergency program of eradication utilizing an integrated pest management (IPM) program of declaring and establishing quarantine boundaries in which there is limited movement of host material, tree removal, and chemical treatments. In its effort to eliminate this pest infestation, APHIS has identified three alternatives.

II. Alternatives

APHIS carefully considered three alternatives in response to the need for better methods to eradicate and contain emerald ash borer infestations: (1) no action, (2) quarantine action, and (3) integrated eradication program (the proposed action). Each is described briefly in this section and the potential impacts of each are considered in the following section.

A. No Action

Under the no action alternative, APHIS would not implement any quarantine or control measures to eradicate emerald ash borer infestations. Some control measures could be taken by other Federal or non-Federal entities; those actions would not be under APHIS' control or funded by APHIS. In the absence of more effective measures to contain and control the emerald ash borer, the gradual spread of the beetle in the vicinity of the Michigan, Ohio, and Ontario, Canada, areas of infestations would be expected to continue. Local business owners and area residents could attempt to control damages from beetle infestations by removing the infested trees from their properties. The lack of effective control measures to prevent the spread of the emerald ash borer from its initial site of introduction could lead to an increase in beetle populations as well as its range of distribution. This would result in more continuing costs for detection and removal of infested ash trees.

B. Quarantine Action

Under this alternative, APHIS would work cooperatively with the Ohio Department of Agriculture (ODA) to implement program control measures to eradicate the emerald ash borer in Lucas County, Ohio. The quarantine area has been delineated by certain boundaries and all ash trees have been marked or identified. The beetle was detected in a rural area near the intersection of Berkley Southern Road and Reed Road between Whitehouse and Swanton township. The quarantine area or treatment areas are further divided into zones. The center or core area within the quarantine boundary is designated as a tree removal zone. The next zone rotating in an outward manner would be designated as a chemical treatment area. Restrictions on movement and/or treatment, such as tree removal, would reduce the spread of emerald ash borer infestations to other areas.

Current regulations require any infested trees discovered by the program to be cut and removed in a manner that eliminates all life stages of the beetle. The ODA has quarantined the affected site and the surrounding area to prevent the beetle's spread. All infected trees within the designated tree removal zone will be cut and chipped on site into 5/8-inch diameter chips. This measure will ensure it is small enough to kill any beetle or beetle larvae. The quarantine will restrict the movement of firewood, green lumber, and other living, dead, cut or fallen material, including nursery stock, logs, stumps, roots, and branches from any ash trees. These materials may be moved within the quarantine area but would be restricted from moving outside the area.

C. Integrated Eradication Program (Preferred Alternative)

Under this alternative, APHIS would use a combination of IPM methods (including alternative B) with chemical treatments to prevent the further establishment and expansion of the emerald ash borer. The program would consist of work activities such as survey, tree removal, systemic treatments (this could include trunk injections, soil drenches, or stump treatment), and other regulatory actions in a quarantine area. The continuation of survey and quarantine activities in this program would depend upon the extent to which the emerald ash borer is effectively eliminated from potential ash trees within the program area. Each of the program actions would be extended in length and geographical scope if evidence of new infestations are found in ash trees within the quarantine area or outside the present quarantine boundaries. Environmental concerns would need to be addressed again if expansion of a new quarantine area is required.

III. Environmental Consequences

There are potential impacts from each of the alternatives being considered. The pest risk from emerald ash borer is an important consideration for all alternatives. Potential program impacts arise from each of the chemical treatments, but most of the treatment impacts are not expected to be substantial. The potential affected areas are primarily rural and residential areas. Exposure to humans and potential effects to human health are primary considerations addressed for program actions in these locations.

A. No Action

Environmental impacts that could result from APHIS' implementation of the No Action alternative relate primarily to pest risk effects. The potential establishment of emerald ash borer would be associated with damage to and loss of valuable ornamental and commercial ash trees, spread of the beetle to other areas of the country with resultant damage to and loss of trees, loss of associated forest products (e.g., applications of hardwood for flooring, furniture, baseball bats), and private or uncoordinated use of pesticides to control the pest with associated adverse impacts to the environment (the physical environment, human environment, and nontarget species).

The wide distribution of host trees suggests the danger of spread across much of the country with increases in damage and losses commensurate with the spread. The damage and losses could result in reductions in private property value. The damage and losses to commercial trees would lower the value and production of timber and tree products such as lumber used in the production of furniture. The changes in the composition and age structure of forests resulting from No Action could have long-term effects on the ecological relationships in the forested areas. There could be losses in recreational revenue to some areas from the diminished amount of certain activities such as fall foliage visitations. There would be losses of valuable shade and ornamental trees in residential areas. The potential for future quarantine restrictions on the export of logs and nursery stock increases if no action is taken. The primary environmental consequences of this alternative are increased risk of pest spread and elevated environmental risks from uncoordinated application of pesticides to limit damage from the emerald ash borer. The potential adverse impacts from selection of this alternative are considerably greater than those anticipated for the other alternatives.

B. Quarantine Action

The environmental consequences of this alternative relate primarily to the potential for the reduction of pest risk as compared to the No Action alternative and to potential environmental effects from tree and other host plant removal methods. The environmental consequences of this alternative depend upon the ability of the quarantine and removal of susceptible host plants to reduce pest risk. Potential movement of adult beetles outside the quarantine area could result in expansion of the infested area with commensurate increase in environmental damage. Although the rate of the beetle spread would be much slower with the quarantine action alternative than with the No Action, the potential for damage and losses would be similar as the infested area expanded. The lack of chemical treatments under this alternative would not protect susceptible host plants from any adult beetle that flies to trees adjacent to the quarantine area.

The ability of this quarantine and tree removal alternative to successfully eradicate emerald ash borer is contingent upon adequate knowledge of the pest and effective control measures to eliminate the pest and prevent access of the pest to susceptible host plants. The determination of locations for host plant removal are based upon known dispersal patterns and flight distances of the adult beetles. Although it is certain that removal of all host plants ensures eradication, it is less clear how far individual beetles, particularly mated female beetles, are likely to disperse to spread eggs to susceptible host plants. The presence of many susceptible host plants near the point of introduction in this program makes it likely that any adult female beetles would place all eggs on susceptible host plants close to this location. The establishment of a quarantine area and removal of all infested ash trees within the core area or from the point of introduction would be based upon site conditions and likely dispersion for the beetles. Future surveys and monitoring will be required to determine if expansion of the boundaries and removal of infested host plants are needed.

The removal of susceptible host plants may have adverse effects on local wildlife that depend upon this vegetation for food, cover, and related needs. This is particularly true for some invertebrates and other animals that have a limited foraging range. The primary issue to humans from loss of plants is visually aesthetic while the impacts on environmental quality from removal of trees are expected to be negligible. Although there could be some limited soil erosion at the site of tree removal, most locations have other forms of groundcover, and new plant growth on these sites is anticipated shortly after removal of susceptible species.

C. Integrated Eradication Program

The environmental consequences of this alternative relate primarily to the potential for pest risk reduction and to the potential environmental effects from host plant removal and injection treatment of host plants. The primary pest risk issues related to establishment of the emerald ash borer are described under the No Action alternative and will not be repeated here. The primary environmental issue relates to susceptible plant host removal and are described under the quarantine action alternative and will not be repeated here. The environmental consequences of chemical treatments are described in this section.

1. Injection Treatment

Effective operational implementation of the chemical injection applications by the program could help to protect susceptible host plants and assist in the efforts to contain and eradicate the emerald ash borer. This would alleviate concerns that the quarantine and tree removal alternative may not remove all host plants infested by any beetles that dispersed from the point of introduction. Although injection treatments have not been demonstrated to kill all beetles in infested trees, their utility in chemical treatments to protect trees from ongoing infestations has proven beneficial in other programs such as the Asian longhorned beetle programs in China, New York, and Illinois. This approach could prevent the damage to and loss of many valuable ornamental and commercial ash trees, loss of associated forest products (e.g., applications of hardwoods for flooring, furniture, and baseball bats), and the private or uncoordinated use of pesticides to control emerald ash borer damage with associated adverse impacts to the environment (the physical environment, human environment, and nontarget species).

Effective trunk injection applications and soil drenches provide an alternate means of protection for trees to the practice of removing and destroying potential host trees. The program will also chemically treat the stumps when the tree is removed to prevent regrowth. The herbicide proposed for this application is triclopyr. Triclopyr, trade name Garlon®, a pyridine, is a selective systemic herbicide used for control of woody and broadleaf plants along rights-of-way, in forests, on industrial lands, and on grasslands. This product is nontoxic to bees, fish, and practically nontoxic to the aquatic invertebrate Daphnia magna, a water flea (LC_{50} for the triclopyr salt of 1170 parts per million). Environmental consequences from this chemical application are considered to be minimal.

The insecticide proposed for application against beetles is imidacloprid. Determination of the potential environmental impacts from this alternative requires analysis of toxicity, environmental fate, exposure, and associated risks from imidacloprid injections and soil drenches.

a. Toxicity

Imidacloprid is a systemic, chloro-nicotinyl insecticide chemically related to the tobacco toxin nicotine. The mode of toxic action is unique and works by interfering with the transmission of stimuli in the insect nervous system. Specifically, it causes a blockage in a type of neuronal pathway (nicotinergic) that is more abundant in insects than in warm-blooded animals. Because of their molecular shape, size, and charge, nicotine and nicotinoids fit into receptor molecules in the nervous system that normally receive the molecule acetylcholine. This molecule carries nerve impulses from one nerve cell to another or from a nerve cell to the tissue that a nerve controls. Imidacloprid overstimulates the nerve, ultimately resulting in the insect's paralysis and eventual death. Since this nicotinergic site of action is more prevalent in insects than in higher organisms, the pesticide is selectively more toxic to insects.

The acute oral toxicity to mammals is moderate. The acute oral median lethal dose of imidacloprid to rats is 450 milligrams per kilogram (mg/kg) body weight. The acute dermal median lethal dose to rats of imidacloprid is greater than 5,000 mg/kg. Imidacloprid is not irritating to eyes or skin and is not a skin sensitizer. Signs and symptoms of intoxication include fatigue, twitching, cramps, and muscle weakness including the muscles for breathing. Chronic toxicity from imidacloprid is low. The systemic No Observed Effect Level (NOEL) for a 2-year feeding study of male rats was 5.7 mg/kg based on increased thyroid lesions observed at the next higher dose, 17.1 mg/kg. The reproductive NOEL determined from a three-generation reproduction study of rats was 8 mg/kg based upon decreased pup body weight at 20 mg/kg. Imidacloprid may be weakly mutagenic. Test results were negative for mutagenicity in all but 2 of the 23 laboratory mutagenicity assays conducted. The positive assays were for genotoxicity in Chinese hamster ovary cells and changes in chromosomes in human lymphocytes. The U.S. Environmental Protection Agency (EPA) has classified imidacloprid in “Group E” in regards to carcinogenic potential. This indicates that the submitted studies provide evidence of noncarcinogenicity for humans.

Toxicity to other wildlife varies considerably. Imidacloprid is moderately to severely toxic to birds, but the repellant nature of imidacloprid to birds makes hazardous exposures unlikely. It is severely toxic to bees, but it is not considered a hazard to bees when used as a seed treatment. Imidacloprid is acutely toxic to adult fish at high concentrations and slightly toxic to daphnia.

b. Environmental Fate and Exposure

Imidacloprid residues from injection applications are not expected to persist in the environment. The vapor pressure of imidacloprid is low and little volatilization to the atmosphere is expected. Imidacloprid is moderately soluble in water, and its half-life in water exceeds 31 days at pH 5, 7, and 9. Soil drench applications and trunk injections are not expected to result in any transport of imidacloprid to groundwater or surface water. Imidacloprid adsorbs to soil particles and is expected to have low mobility in the dry soils within the treatment area. The half-life in soil varies from 48 to 190 days depending upon the organic matter, ground cover, and plant uptake. The systemic action of imidacloprid from drenches and injections would be expected to carry the residues to other locations within the plant. The insecticidal activity of imidacloprid within trees has been shown to remain effective for up to 1 year, but the distribution within treated trees is limited to those portions that are actively transporting fluids and nutrients. There is no systemic movement into heartwood. Imidacloprid from soil drench applications could be taken up systemically by other nonhost plants. The program treatments using soil drench applications would only be at locations where the primary uptake of imidacloprid is by a susceptible host plant. Trunk injection would be made at locations where considered impractical for soil drench application. This approach precludes potential adverse effects to nontarget species and ensures that the applications protect only susceptible host plants of emerald ash borer.

Adherence to the pesticide label and standard operating procedures ensures that exposures are minimal. This has been demonstrated by APHIS’s Environmental Monitoring conducted during program operations in New York and Illinois. The injections would not be expected to routinely result in any exposure to humans except the program applicators. The required protective gear and safety precautions minimize applicator exposure. The applicators would ensure that the trunk injection devices are not disturbed during injection and the devices are removed from the drill holes when the application is complete to prevent exposure to the public. The only route for potential exposure of the public to imidacloprid is from the accidental scenario of a person digging in the treated soil following soil drench applications. Much of the compound would have adsorbed to soil particles or would have been taken up by the host plant and, thus, the actual exposure to imidacloprid would be minimal. The injection applications avoid exposure to most species of wildlife. The only species likely to be directly exposed by these injections are those nontarget invertebrates present in the treated soil or in the wood of the treated tree. Some insectivores and scavengers also could be exposed to residues during foraging activities in the soil below or in the bark of treated trees. The exposures of these species to imidacloprid are expected to be light. Insectivorous birds are repelled by imidacloprid residues and would avoid locations where exposure was possible.

c. Risk

The risk of adverse effects to environmental quality are minimal. The imidacloprid from soil drenches and trunk injections is not expected to volatilize to the atmosphere, is not expected to be leached to groundwater, and is not expected to be carried to surface water except from heavy rainstorms. The soil and plant residues are expected to remain active for up to 1 year to protect the trees from infestation by emerald ash borer. Injection treatments are directed to protect susceptible host plants and minimize potential uptake by other plants nearby.

The risks to human health are minimal. The required protective gear and safety precautions for applicators result in potential exposures much lower than any that could result in adverse effects. The anticipated margins of safety from the accidental exposure scenario where a person digs up the soil from the treated area under a tree are less than for the applicators, but no adverse effects are anticipated for those individuals either.

Mortality from exposure would be expected for some invertebrates. The populations of insects directly exposed to imidacloprid would be expected to decrease temporarily in the treatment area until the residues decrease and recolonization occurs from surrounding areas. This recovery would be expected to occur more rapidly in the soil because the compound would be readily taken up by the tree roots and residues would not persist in the soil. The insects exposed to residues in the trees would require longer periods of time for recolonization. Although the prey for some insectivores would decrease in treated areas, the additional forage effort by these species is not expected to be increased greatly. Insect populations would remain unaffected in the untreated plants. The low exposures to birds and insectivores foraging in the soil and tree bark are not expected to result in any adverse effects to those species.

2. Other Issues

An effort was made by APHIS to determine what, if any, measures would be required for program compliance with the Endangered Species Act of 1973. The potential for exposure and any adverse effects was analyzed for those endangered and threatened species and their habitats within the proposed program area. Based upon the findings of that analysis, it was determined that program activities in the proposed quarantine area would have no effect on threatened and endangered species.

Consistent with Executive Order 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations," APHIS considered the potential for disproportionately high and adverse human health or environmental effects on any minority populations and low-income populations. The environmental and human health effects from the proposed applications are minimal and are not expected to have disproportionate adverse effects to any minority or low-income populations.

Consistent with Executive Order 13045, "Protection of Children From Environmental Health Risks and Safety Risks," APHIS considered the potential for disproportionately high and adverse environmental health and safety risks to children. The program applications are made to trees and soil below trees in urban parks and residential areas where children would be expected to play and climb trees. The program applicators ensure that the general public is not in or around areas being treated, so no exposure will occur for trunk injection applications and the only possible exposure could occur from a child playing in the treated soil under a tree. This accidental exposure scenario was analyzed and it was determined that no adverse human health effects would result to the child. Therefore, it was determined that no disproportionate effects on children are anticipated as a consequence of implementing the preferred alternative.

IV. Agencies, Organizations, and Individuals Consulted

This environmental analysis was prepared and reviewed by APHIS. The addresses of participating APHIS units, cooperators, and consultants (as applicable) follow.

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U.S. Department of Agriculture
Animal and Plant Health Inspection Service
Policy and Program Development
Environmental Services
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Riverdale, MD 20737–1238

U.S. Department of Agriculture
Animal and Plant Health Inspection Service
Eastern Regional Office
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Raleigh, NC 27606–5202

U.S. Department of Interior
U. S. Fish & Wildlife Service
6950 Americana Parkway
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Reynoldsburg, OH 43068

Department of Natural Resources
Ohio Division of Wildlife
Cane Creek Wildlife Research Station
Oak Harbour, OH 43449

Finding of No Significant Impact
Emerald Ash Borer Cooperative Eradication Program
Environmental Assessment
April 2003

The U.S. Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS), has prepared an environmental assessment (EA) for a proposed program to contain and eradicate the emerald ash borer. The proposed program is needed to improve containment and control of the emerald ash borer, a destructive new exotic insect pest which has been detected at locations in the United States. The EA, incorporated by reference in this document, is available from–

U.S. Department of Agriculture
Animal and Plant Health Inspection Service
Plant Protection and Quarantine
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4700 River Road, Unit 137
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The EA analyzed three alternatives: no action, quarantine action, and integrated eradication program. Each alternative was determined to have potential environmental consequences. Based on the information presented in the EA, I have selected the integrated eradication program as the preferred alternative because of the feasibility to implement an integrated management operational program that will deliver the capability to meet the pest risk reduction objectives and to provide the lower overall risk to human health and the natural environment than the current operational methods.

APHIS considered the potential environmental consequences of each alternative. Based on analysis of the environmental impacts, APHIS has determined that there would be no significant impact on the quality of the human environment from the implementation of the preferred alternative, integrated eradication program. APHIS' finding of no significant impact for this rule was based upon the application of standard operating procedures for the applications and their expected environmental consequences, as analyzed within the EA. APHIS will continue to confer, where appropriate, with the U.S. Fish and Wildlife Service to ensure that this program will have no adverse effects on endangered and threatened species.

In addition, I find that the environmental process undertaken for these tests is entirely consistent with the principles of environmental justice as expressed in Executive Order 12898 and 13045 and that implementation of the control measures will not result in disproportionately high and adverse human health or environmental effects on any minority populations, children, and low-income populations. Lastly, because I have not found evidence of significant environmental impacts associated with the proposed program, I further find that an environmental impact statement does not need to be prepared and that the program may proceed.

/S/
John C. Stewart
Senior Regional Program Manager
Eastern Region
Plant Protection and Quarantine
Animal and Plant Health Inspection Service

4/22/03
Date