FSC-TPL-01-002 Application for a derogation to use a highly hazardous pesticide.

Dicamba

Name and contact details of certification body requesting derogation:	SCS Dave Wager dwager@scscertified.com 510 251-7049
Active ingredient for which derogation requested:	Dicamba
Geographical scope of requested derogation:	Michigan
Is there an accredited or preliminarily accredited FSC Forest Stewardship Standard applicable to the territory concerned?	FSC US standard
Requested time period for derogation: (nb Derogations shall normally be issued for a five-year period. There will be a presumption against renewal of a derogation after the expiry of the five-year period).	5 years

1. Demonstrated need

Need may be demonstrated where:

- The pesticide is used for protecting native species and forests against damage caused by introduced species or for protecting human health against dangerous diseases, OR
- Use of the pesticide is obligatory under national laws or regulations, OR
- Use of the pesticide is the only economically, environmentally, socially and technically feasible way of controlling specific organisms which are causing severe damage in natural forests or plantations in the specified country (as indicated by consideration, assessments and preferably field-trials of alternative non-chemical or less toxic pest-management methods)

Explain how the proposed use complies with the specified criteria for need, including the consideration of alternatives which do not require the use of pesticides on the FSC list of 'highly hazardous pesticides':

Overview

Dicamba is used in the control of non-native invasive plants in Michigan forests and openlands. Michigan openlands include grasslands, jack pine barrens, wildlife openings, roadways, and rights-of-way. Dicamba acts like a naturally occurring plant hormone and causes uncontrolled growth in plants. At sufficiently high levels of exposure, the abnormal growth is so severe that the plant dies.

Specifics

More specifically, Dicamba is used in combination with other herbicides or independently as part to the control of non-native invasives species such as honeylocust, honeysuckle, kudzu, multiflora rose, spotted knapweed, kochia, and Canada thistle. Dicamba is used in conjunction with mechanical, cultural and biological treatments to slow the spread and control of many invasive species.

In Michigan, invasive species such as those listed above reduce the biodiversity of our forest, reduce regeneration of important native trees, and reduce forest health. Michigan Department of Natural Resources (MDNR) manages over 4.5 million acres of diverse cover types that are mainly found in the northern Lower Peninsula and Upper Peninsula. The Draft 2006 State Forest Management Plan states that the introduction of non-native plant and animal species and diseases are a serious threat to the health of the State's forest ecosystems, and can have major ecological consequences for the composition of native forest communities. The desired future condition of state forest is that they be free from invasive plant and animal species that degrade ecological and socio-economic values and productivity, or the biological impact of such species is mitigated to the extent possible.

Michigan's Wildlife Action Plan (WAP) identifies threats to wildlife and landscape features that were evaluated as high severity throughout the State, one of these highest identified threats was the introduction of invasive non-native species.

As many as one-third of Michigan's plant species may now be non-native. In the Great Lakes basin, at least 37 terrestrial plant species and seven terrestrial insect species are invasive and pose threats to natural communities in Michigan.

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For example, Southern Lower Peninsula forest have been invaded by several types of non-native honeysuckle which takes over the under story of woodlands out competing native flora and reducing regeneration of native tree species. First, introduced to North America from Eurasia in 1752, honeysuckles vigorous growth and early spring leaf-out inhibit the growth of native trees and shrubs and ground layer species. If not controlled they become monocultures and eventually replace native plants by crowding or shading them out and by depleting soil moisture and nutrients.

Cut honeysuckle will resprout vigorously if the stump is not treated with a herbicide. Controlled burns may kill seedlings but will only top-kill larger plants. Herbicide treatments include foliar spray, cut-stump, frilling and basal bark treatment. Dicamba is labelled for honeysuckle treatment.

Jack pine barrens are ecologically rare openland plant communities found within a mosaic of jack pine forest. These openlands are threatened by fire suppression and invasive species such as spotted knapweed. Spotted knapweed is native to Eurasia and was accidentally released in the United States in the1890s. In recent years it has been rapidly spreading across the Midwest, including Michigan. Spotted knapweed releases a toxin into the soil that hinders the growth of other plants which leads to simplified areas with reduced plant diversity, especially of native plants. Small infestations can be controlled with hand pulling or digging, however, care must be made to remove the entire root system so not to prevent resprouting. Intense annual prescribed fire can reduce plant populations but may also impact native plants on the site. Mowing can help limit seed production and spread but does provide needed control of established plants.

Herbicide treatment of spotted knapweed is often a key step to control which, may also include mechanical treatments or prescribed fire. Chemical treatments of spotted knapweed include a buffer area of 15 feet to ensure control of seedlings and roots. Follow up control is often needed to ensure control. Dicamba is labelled for control of spotted knapweed.

There are numerous types of herbicides that can be used to control non-native invasive plants, including glyphosate. There are concerns that with repetitive treatments of specific herbicides such as glyphosate, that individual plants' will develop a tolerance to a specific chemical. By alternating chemical types and approaches there is less risk of the development of tolerance to specific chemicals. Dicamba is a selective herbicide that controls broadleaf plants and does not harm native grasses. Using a product that is selective and affects as few plants as possible has been a preferred approach compared to unnecessarily applying a broader spectrum product.

Not Controlling Invasive Plants
Invasive species left unchecked would compete with native plants, intercept sunlight, and monopolize available soil nutrients and moisture, resulting in slower growth of native plants, mortality and ultimately poor system health.

Control of invasive species is essential for the successful restoration, establishment and growth of native ecosystems. Without control, plants may die due to inability to compete for water and nutrients or growth rates may be so low that they can not compete against non-native plants. Effects can range from widespread mortality in new plantings to severe suppression of entire

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stands for indefinite periods.

Biological controls are used when they are available and feasible. In many cases mechanical or chemical treatments are needed to get invasive plant populations reduced to a point where biological controls can be used to keep populations at minimal levels.

Dicamba & Environment
Dicamba may cause damage to plants as a result of its absorption from the soil by plant roots. Halftimes of dicamba in soil usually are between 1 and 6 weeks (Cox 1994, Muller and Buser 1997). Dicamba is highly mobile in and poorly adsorbed by most soil types. The adsorption of dicamba to organo-clay soil is influenced by soil pH with the greatest adsorption to soil occurring in acidic soils (Zhao et al. 1996).

Dicamba is moderately persistent in soil. Dicamba is likely to be more rapidly degraded in soils with high microbial populations but dissipates more slowly in hardwood forests and wetlands than would be expected from the results of laboratory studies (Voos and Groffman 1997a,b). The slower than expected field dissipation is probably attributable to sorption of dicamba in acidic and highly organic soil horizons.

Dicamba salts used in Banvel and Vanquish formulations are highly soluble in water. A recent study conducted by the U.S. Geologic Survey (USGS 1998) found dicamba in 0.11%-0.15% of the ground waters surveyed. The maximum level detected was 0.0025 mg/L. There was no apparent correlation between the prevalence of dicamba in groundwater from agricultural areas (0.11%) compared with non-agricultural urban areas (0.35%). Several additional studies summarized in SERA (1994b) and studies published in the more recent literature (Miller et al. 1995, Ritter et al. 1996) report higher frequencies of occurrence of dicamba in groundwater from agricultural areas.

Dicamba was detected in 0.32% of stream samples and 0.12% of samples from major aquifers (USGS 1998). The highest level detected was 0.00016 mg/L. In an agricultural area where herbicides are used extensively, dicamba was found in 17%- 55% of water samples from farm ponds and dugout waters (Grover et al. 1997). Dicamba was found in surface runoff when a rainstorm occurred soon after application to agricultural fields in western Washington (Mayer and Elkins 1990). Several additional monitoring studies report low concentrations of dicamba in soil runoff. Usually, however, percolation through soil will predominate over soil runoff (SERA 1994b.

Dicamba is relatively volatile, and this process may be a significant factor in the dispersion of dicamba in the environment. In a recent review, Majewski and Capel (1995) cite the occurrence of dicamba, along with several other pesticides, in rain water at sites distant from any known agricultural application. In a small agricultural watershed in Canada, seasonal estimates of the atmospheric deposition of dicamba over a 4-year period ranged from 0.02% to 0.18% of the total amount applied each year (Waite et al. 1995).

At a level of 10 mg/kg in sandy loam soil, dicamba caused a transient decrease in nitrification after 2 but not 3 weeks of incubation (Tu 1994). The investigator determined that the decrease in nitrification is not substantial and does not suggest the potential for a prolonged impact on microbial activity. In the same study, dicamba did not affect ammonia formation or sulfur

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oxidation. In a more recent laboratory study, dicamba, at a concentration of 1 mg/kg soil, did not affect urea hydrolysis or nitrification in four soil types (Martens and Bremner 1993).

Dicamba is toxic to many terrestrial broadleaf and conifer species, but is generally less toxic to grasses. Some aquatic plants are highly sensitive to dicamba, with EC50 values for sensitive species between 0.1 and 0.2 ppm. Other plant species are less sensitive, with EC50 values greater than 10 ppm (SERA 1994b). A more recent study on the effects of dicamba on aquatic plants (Fairchild et al. 1997) does not alter the risk assessment for aquatic plant species given in SERA (1994a).

Dicamba was tested for acute toxicity to a variety of aquatic animals. The studies accepted by the U.S. EPA found dicamba acid and DMA salt to be practically nonionic to aquatic invertebrates. Studies accepted by the U.S. EPA found dicamba acid to be slightly toxic to cold water fish (rainbow trout), and practically nontoxic to warm water fish. Banvel formulations were tested in fish and categorized as practically nontoxic. The U.S. EPA did not require additional testing for Vanquish, based on the low toxicity and bioaccumulation determined in tests using the Banvel formulations.

Although the toxicity of dicamba to experimental mammals has been well characterized, little information is available on toxicity to wildlife species. Based on acute toxicity tests dicamba is classified as slightly toxic to experimental mammals. Banvel formulations were less toxic to laboratory mammals than dicamba alone. No tests of formulations for acute toxicity to wildlife mammals have been reported. The acute toxicity of dicamba to birds is low. Based on acute toxicity tests, dicamba acid is classified as practically nontoxic to duck and quail. Livestock may graze dicamba-treated areas without restriction, unless they are actively producing milk. Meat animals must be removed from treated areas 30 days before slaughter (C&P Press 1998). No information was found in the published literature regarding the chronic effects of dicamba and its formulations in wildlife species.

Human Safety

Most of the available data on potential human health effects come from laboratory animal studies. These data are evaluated and used to make inferences about potential effects on human health. For dicamba and formulations containing dicamba as the only active ingredient, the data are from studies conducted by the manufacturer. These studies were submitted to the U.S. EPA to support product registration but are not available to the general public.

Based on an acute oral LD50 of 2740 mg/kg in rats, the U.S. EPA places dicamba in Category III (Rowland 1998). This category is associated with a code word of CAUTION that indicates that the compound may be harmful if swallowed (U.S. EPA 1998). Smaller animals are less sensitive than larger animals to dicamba in acute oral toxicity tests. The lowest reported LD50 for dicamba in any species is 566 mg/kg (guinea pigs and rabbits) (SERA 1994b).

The toxicity level of dicamba applied directly to skin was greater than 2000 mg/kg in rats. Thus, for acute dermal toxicity, dicamba is classified as Category III with the following verbal interpretation: Harmful if absorbed through skin. Avoid contact with skin, eyes or clothing (Rowland 1998, U.S. EPA 1998).

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Dicamba causes neurological effects in rats, dogs, and hens. The current acute dietary RfD for dicamba of 0.1 mg/kg/day is based on a neurological effect. Recently, Potter et al. (1993) published a study on the inhibition of an enzyme important in neurological function.

Very little information on the carcinogenic potential of dicamba is available in the recent literature. Mutagenicity studies of dicamba in bacteria, human cells, and whole animals are inconclusive; both positive and negative results are available. Similarly, dicamba does not appear to promote the activity of chemicals that cause cancer (Espandiari et al. 1995, 1996). Cantor et al. (1992) examined the relationship between exposure to different pesticides, including dicamba, and the development of non-Hodgkin's lymphoma (NHL). The central or best estimates of the relative risks ranged from approximately 1.2 (20% higher than controls) to 3.9 (390% higher than controls). In no case, however, were the estimates of risk tabulated by Cantor et al. (1992) statistically significant. The U.S. EPA recently reviewed the carcinogenicity on dicamba and classified the data on this compound as insufficient to support a quantitative risk assessment (Cogliano 1995). The animal data cannot be used because the results are negative (i.e., dicamba did not cause cancer in the bioassays conducted to date). The human data, while raising concern, cannot be used to quantify risk because no reliable dose estimates are available. In addition, the weight of evidence does not clearly support the determination that dicamba is a human carcinogen.

2. Specified controls to mitigate the hazard

The derogation shall specify the controls that will be implemented to mitigate the hazard associated with the use of the pesticide, for example restrictions related to weather conditions, soil types, application method, water courses, etc..

If the specified formulation is considered to reduce the level of hazard then the information on which this claim is based shall be presented, and the applicant shall provide credible independent, third party support for the claimed reduction of hazard.

Specify the controls that will be implemented to mitigate the hazard:

Herbicides sold in the United States must be registered with the Federal government and in some cases by state regulatory agencies. They are reviewed and regulated by the U.S. Environmental Protection Agency (USEPA) under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA 1974; 7 J.S.C. 135 et seq., Public Laws 92-516, 94-140, and 95-356) and recent amendments. EPA regulations are enforced in Michigan through the Michigan Department of Agriculture.

The printed information and instructional material that is sold with a registered herbicide is known as the "label," and constitutes a legal document. These instructions are considered a part of compliance with FIFRA and other Federal regulations, and failure to use a herbicide in accord with label restrictions can lead to severe penalties. The label provides information on the chemical compound(s) comprising the active ingredient(s) of the herbicide, directions for correct use on target plant species, warnings and restrictions, and safety and antidote information.

Purchasers and applicators of restricted-use pesticides must comply with the certification requirements of the 1994 Michigan Natural Resources and Environmental Protection Act as amended (P.A. 451), Part 83 and detailed in Regulation 636 "Pesticide Applicators". This requires studying training manuals prepared by Michigan State University Extension and passing an examination administered by MDA. Recertification is required every three years and may be obtained by one of two methods. The applicator may study a training manual (Extension Bulletin E-2195) and pass an examination, or attend classes accredited by MDA for continuing education credits and obtain sufficient credits for the specific category of certification. Both methods ensure that additional information was provided to applicators in the safe and effective use of restricted-use pesticides.

Resource Application

As part of operational planning process alternatives are evaluated to control invasive plant species. Mechanical, biological, cultural as well as chemical treatments are evaluated for effectiveness and for cost efficiencies. In many cases several alternative control methods will need to be implemented for control of aggressive non-native invasive plants or populations. Frequently the application may be as a strip or spot application where as little as 10% to 20% of the site will be treated with the herbicide.

Land managers are encouraged to take a triage approach to managing invasive species by prioritizing threats, needs and approach. High priority is given to areas with high ecological values and where control is feasible. Work around these priority areas first addressing small outliers and then moving toward the core of the infestation. The next priority is to address small infestations of high threat species anywhere they can be found and to use the most effective

2. **Specified controls to mitigate the hazard**
means possible for their control. Once these high priority threats are addressed, land mangers should address lower priority areas where control will be effective. The lowest priority are sites with infestations where control is not feasible, at these site land managers should monitor the edge of these sites and implement control efforts to maintain the spread. Throughout this process land managers are encouraged to monitor and learn from the result and to share information gained with others. Furthermore, land mangers are encouraged to use mechanical and cultural treatments to reduce the spread of invasive species as well management to eliminate populations.

3. Program to identify alternatives

The application shall describe the program(s) which are in place in the territory concerned or which will be put in place during the period over which the derogation will be applicable, designed to identify alternative pest control methods which do not use highly hazardous pesticides.

Describe the program(s) that are in place to identify alternatives:

The MDNR continually looks for a variety of methods to control invasive species including biological control, mechanical treatment, cultural practices and herbicides. Over the last ten years the MDNR has worked with Michigan State University (MSU), providing financial support and on the ground testing, of several biologic controls. For example, working with MSU, two successful biological controls have been developed for purple loosestrife a non-native invasive wetlands forb. Within the MDNR, research and testing is being conducted to evaluate different methods of controlling invasive species. A recent Wildlife Division project, that has been just been concluded, looked at two different herbicides and their effectiveness in controlling autumn olive, a non-native invasive upland shrub. These herbicide practices were evaluated in-conjunction with the use of prescribed fire as well as evaluating the impact of prescribed fire only. The use of one of the chemicals and prescribed fire provided the best control.

4. Stakeholder support

All applications for derogations shall include evidence that the application is supported by social, environmental and economic stakeholders in the best interests of promoting FSC's goals in the territory concerned. It is the responsibility of the applicant to present this evidence in support of their application (see summary of procedures in Section 8, below).

The level of stakeholder support required will be evaluated taking account of the geographical scope of the derogation, the justification of need, and other factors include in the application such as the strength of the program to identify alternatives, and the level of controls to mitigate the identified hazards.

A written letter of support by the Board of Directors of the FSC National Initiative for the territory concerned shall normally be considered sufficient evidence of national stakeholder support for the application.

Describe the consultation that has taken place and summarise the results:

Stakeholder consultation will occur August 1 through September 16, 2007. This section will be completed at the conclusion of the stakeholder consultation period.

Contingency plan to eliminate use of the pesticide during the derogation period
Derogations shall normally be issued for a five-year period. There is a presumption against renewal at the end of this five-year period unless it can be clearly demonstrated that the program to identify alternatives has been fully implemented but has failed to identify an acceptable alternative in the available time.

Forest managers seeking certification under an approved derogation should therefore ensure that they have a contingency plan in place to eliminate use of the pesticide prior to the end of the derogation period. If derogation is not renewed, the continued use of a highly hazardous pesticide after the expiry of the derogation would be considered a major non-compliance and would lead to the withdrawal of the certificate.

As a condition of use of a derogated pesticide, forest managers shall record quantitative and qualitative information about their use of such a pesticide, and this information shall be included in the certification body's evaluation reports and in all subsequent surveillance reports.

Compliance with these requirements would need to be demonstrated by an applicant for certification at the Forest Management Unit (FMU) level and be verified by the certification body prior to the issue of a certificate. However, this evaluation is independent of the decision to issue a derogation for use of a pesticide over a geographical area.

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