

Proposed Item for Biobased Designation

The following biobased product information has been collected to support item designation by USDA for the BioPreferred program. This summary reflects data available as of August 1, 2008.

Title: Fuel Conditioners

Description: Products formulated to effectively remove deposits accumulated, increase lubricity, remove moisture, increase the cetane number, and prevent microbial growths within the fuel system. Winter conditioners lower the pouring point of fuels.

Companies Supplying Item: 12 companies supplying Fuel Conditioners have been identified through internet searches, manufacturer's directories, trade associations, and company submissions.

Industry Associations Investigated: The following industry associations have been investigated for member companies supplying Fuel Conditioners:

- United Soybean Board Association
- National Corn Growers Association
- National Biodiesel Board
- Northwest Biofuels Association
- Russian Biofuels Association
- Biodiesel Association of Australia

Commercially Available Products Identified: Of the companies identified, 24 Fuel Conditioners are commercially available on the market.

Product Information Collected: Specific product information including company contact, intended use, biobased content, and performance characteristics have been collected on 23 Fuel Conditioners.

Industry Performance Standards: Product information submitted by biobased manufacturers and suppliers indicate that have typically been tested to the following industry standards:

- Environmental Protection Agency 40 CFR 79.23 Registration of Fuel Additives
- ASTM International D1094 Standard Test Method for Water Reaction of Aviation Fuels
- ASTM International D2274 Standard Test Method for Oxidation Stability of Distillate Fuel Oil (Accelerated Method)
- ASTM International D6078 Standard Test Method for Evaluating Lubricity of Diesel Fuels by the Scuffing Load Ball-on-Cylinder Lubricity Evaluator (SLBOCLE)
- ASTM International D665 Standard Test Method for Rust-Preventing Characteristics of Inhibited Mineral Oil in the Presence of Water
- Cummins Engine Company L10 Injector Depositing Test Detergency. A standard used to indicate of the ability of a product to provide injector cleanliness and can be used to discriminate fuel/fuel additive quality.

Samples Tested for Biobased Content: 9 samples of Fuel Conditioners have been submitted to independent laboratories for biobased content testing as specified by ASTM standard D6866-04.

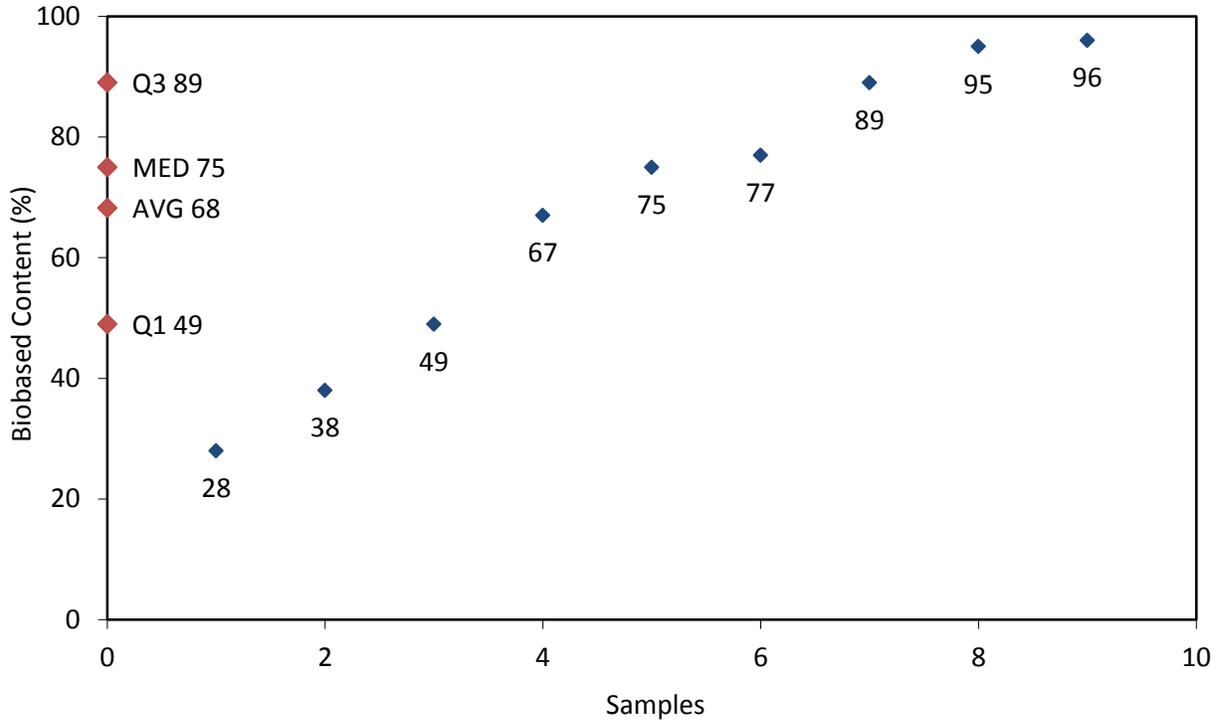
Biobased Content Data: Results from biobased content testing of Fuel Conditioners indicate a range of content percentages from 28% minimum to 96% maximum biobased content as defined by ASTM D 6866-04. A detailed distribution of biobased content levels is included as Appendix A.

Products Submitted for BEES Analysis: Life-cycle cost and environmental effect data for 3 Fuel Conditioners have been submitted to NIST for BEES analysis.

BEES Analysis: The life-cycle costs of the submitted Fuel Conditioners range from -\$3.64 minimum to -\$2.95 maximum per usage unit. The environmental scores range from -0.0337 minimum to -0.0262 maximum. A detailed summary of the BEES results is included as Appendix B.

Appendix A - Biobased Content Data

Fuel Conditioners

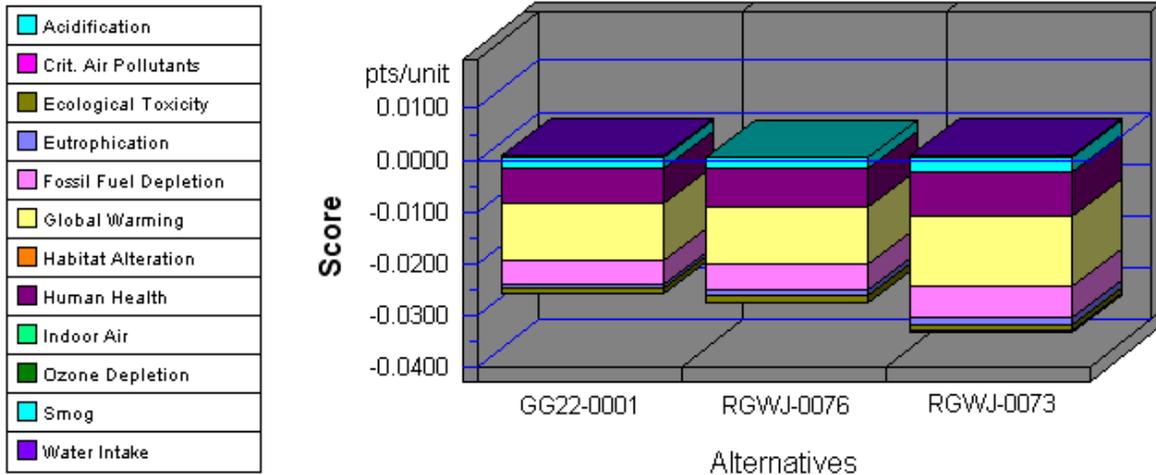


	Companies Identified	Products Identified	C14	BEES
1	B62S	B62S-0003	28	
2	U4RM	U4RM-0001	38	
3	RGWJ	RGWJ-0074	49	
4	RGWJ	RGWJ-0073	67	Yes
5	J7A3	J7A3-0037	75	
6	RGWJ	RGWJ-0076	77	Yes
7	BP37	BP37-0008	89	
8	J3TP	J3TP-0015	95	
9	GG22	GG22-0001	96	Yes

Appendix B - BEES Analysis Results

Functional Unit: 1000 ton-miles driven in a truck¹

Environmental Performance



Note: Lower values are better

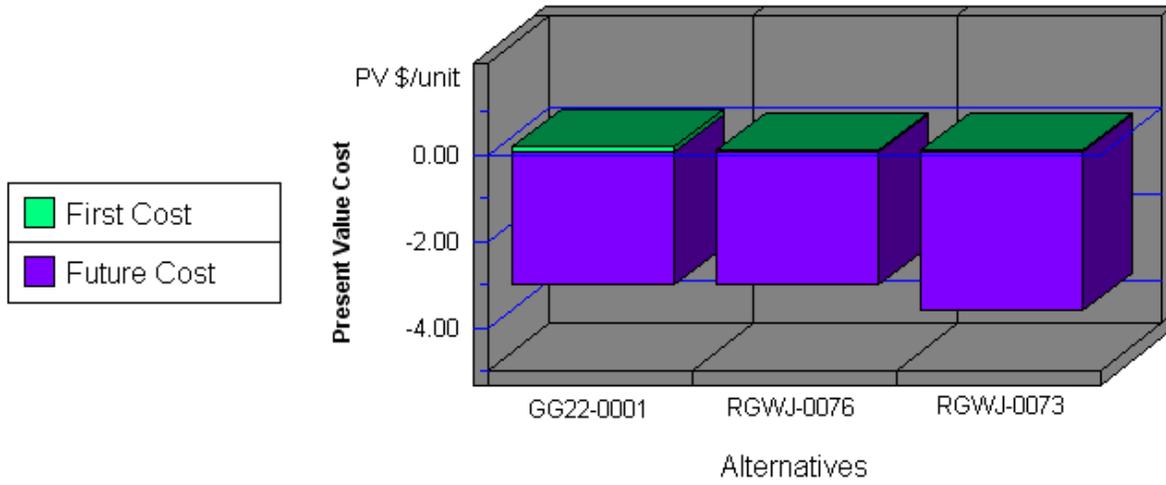
Category	GG22-0001	RGWJ-0076	RGWJ-0073
Acidification--3%	0.0000	0.0000	0.0000
Crit. Air Pollutants--9%	-0.0002	-0.0002	-0.0003
Ecolog. Toxicity--7%	-0.0010	-0.0014	-0.0013
Eutrophication--6%	-0.0007	-0.0008	-0.0012
Fossil Fuel Depl.--10%	-0.0047	-0.0052	-0.0059
Global Warming--29%	-0.0107	-0.0108	-0.0136
Habitat Alteration--6%	0.0000	0.0000	0.0000
Human Health--13%	-0.0068	-0.0076	-0.0086
Indoor Air--3%	0.0000	0.0000	0.0000
Ozone Depletion--2%	0.0000	0.0000	0.0000
Smog--4%	-0.0023	-0.0022	-0.0029
Water Intake--8%	0.0002	0.0000	0.0001
Sum	-0.0262	-0.0282	-0.0337

¹ A ton-mile means 1 ton being transported 1 mile. You can think of 1000 ton-miles as any of the following: 1 ton of goods being transported 1000 miles; 1000 tons of goods being transported 1 mile; or 25 tons of goods being transported 40 miles.

Note on use phase of this item's life cycle: Without a fuel conditioner, 1000 ton-miles requires 10.5 gallons of fuel. However, with a fuel conditioner, 1000 ton-miles means less fuel needed overall (better fuel efficiency). The use phase (of using a fuel conditioner) has been calculated in relation to *not* using conditioner. As a result, the BEES environmental and economic performance scores are negative values for this item's products.

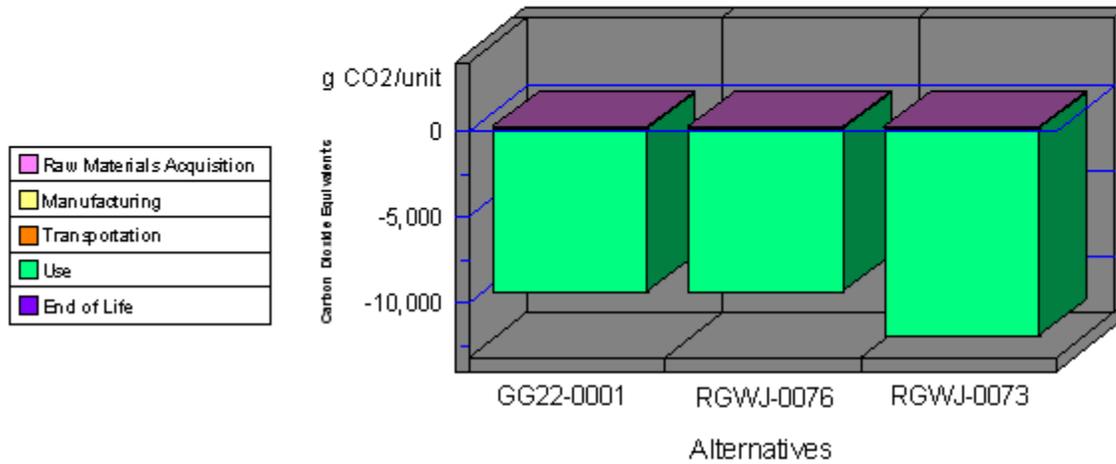
Fuel Conditioners				
Impacts	Units	GG22-0001	RGWJ-0076	RGWJ-0073
Acidification	millimoles H ⁺ equivalents	-3.11E+03	-2.84E+03	-3.99E+03
Criteria Air Polutants	microDALYs	-4.40E-01	-3.83E-01	-5.62E-01
Ecotoxicity	g 2,4-D equivalents	-1.18E+01	-1.65E+01	-1.56E+01
Eutrophication	g N equivalents	-2.35E+00	-2.60E+00	-3.77E+00
Fossil Fuel Depletion	MJ surplus energy	-1.64E+01	-1.83E+01	-2.09E+01
Global Warming	g CO ₂ equivalents	-9.44E+03	-9.50E+03	-1.20E+04
Habitat Alteration	T&E count	0.00E+00	0.00E+00	0.00E+00
Human Health--Cancer	g C ₆ H ₆ equivalents	-4.37E+00	-4.87E+00	-5.56E+00
Human Health--NonCancer	g C ₇ H ₈ equivalents	-3.16E+03	-3.52E+03	-4.02E+03
Indoor Air Quality	g TVOCs	0.00E+00	0.00E+00	0.00E+00
Ozone Depletion	g CFC-11 equivalents	-3.79E-07	-4.18E-07	-4.81E-07
Smog	g NO _x equivalents	-8.59E+01	-8.21E+01	-1.09E+02
Water Intake	liters of water	1.20E+01	3.22E+00	4.01E+00
Functional Unit	-----	1000 ton-miles driven in a truck		
<p>1 Following are more complete descriptions of units: Acidification: millimoles of hydrogen ion equivalents; Criteria Air Pollutants: micro Disability-Adjusted Life Years; Ecological Toxicity: grams of 2,4-dichlorophenoxy-acetic acid equivalents; Eutrophication: grams of nitrogen equivalents; Fossil Fuel Depletion: megajoules of surplus energy; Global Warming: grams of carbon dioxide equivalents; Habitat Alteration: threatened and endangered species count; Human Health-Cancer: grams of benzene equivalents; Human Health-NonCancer: grams of toluene equivalents; Indoor Air Quality: grams of Total Volatile Organic Compounds; Ozone Depletion: grams of chloroflourocarbon-11 equivalents; Smog: grams of nitrogen oxide equivalents; and Water Intake: liters of water.</p>				

Economic Performance



Category	GG22-0001	RGWJ-0076	RGWJ-0073
First Cost	0.11	0.03	0.03
Future Cost-- 3.0%	-3.06	-3.06	-3.67
Sum	-2.95	-3.03	-3.64

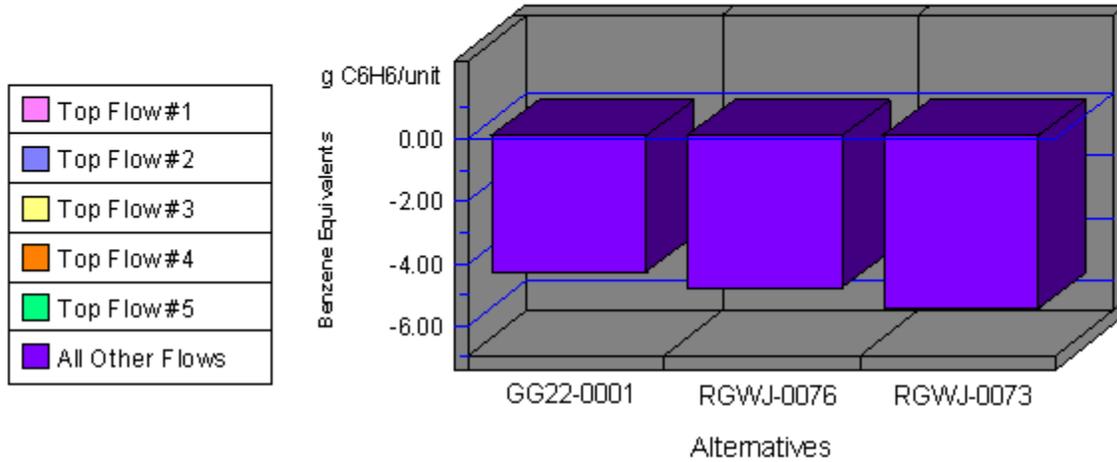
Global Warming by Life-Cycle Stage



Note: Lower values are better

Category	GG22-0001	RGWJ-0076	RGWJ-0073
1. Raw Materials	32	15	11
2. Manufacturing	0	1	0
3. Transportation	3	2	2
4. Use	-9477	-9518	-12020
5. End of Life	0	0	0
Sum	-9442	-9500	-12007

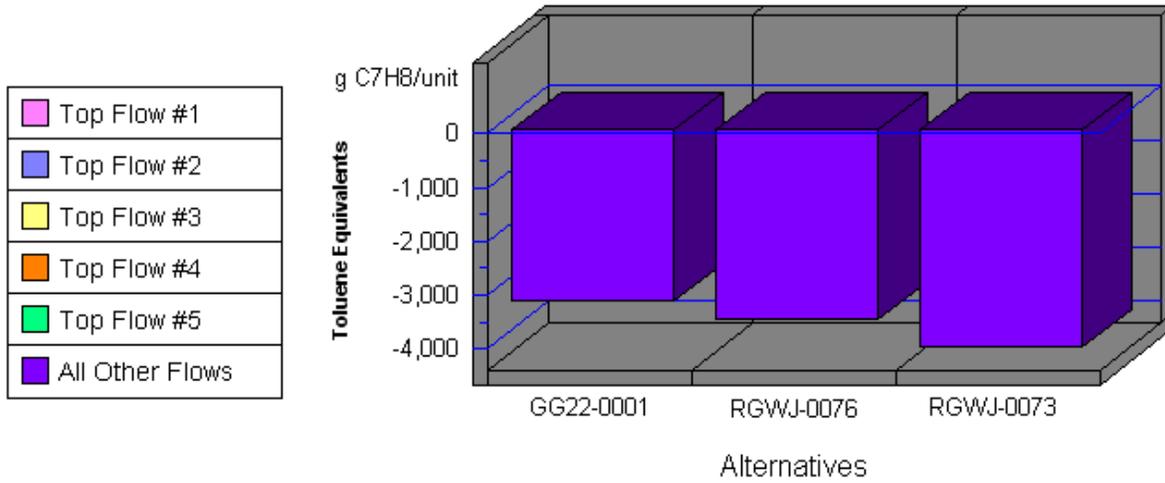
Human Health Cancer by Sorted Flows*



Note: Lower values are better

Category	GG22-0001	RGWJ-0076	RGWJ-0073
Cancer-(w) Formaldehyde	0.00	0.00	0.00
Cancer-(a) Ethylene Oxide (C ₂ H ₄)	0.00	0.00	0.00
Cancer-(w) Dichloroethane (1,2)	0.00	0.00	0.00
Cancer-(a) Ethoprop	0.00	0.00	0.00
Cancer-(a) Vinyl Chloride (CH ₂ Cl ₂)	0.00	0.00	0.00
All Others	-4.37	-4.87	-5.56
Sum	-4.37	-4.87	-5.56

Human Health Noncancer by Sorted Flows*



Note: Lower values are better

Category	GG22-0001	RGWJ-0076	RGWJ-0073
Noncancer--(a) Ammonia (NH3)	0.60	0.01	0.05
Noncancer--(a) Trifluralin (C13	0.23	0.06	0.08
Noncancer--(a) Aluminum (Al)	0.11	0.00	0.00
Noncancer--(a) Methyl Parathion	0.05	0.01	0.02
Noncancer--(a) Carbofuran (C12H	0.04	0.01	0.01
All Others	-3,164.43	-3,516.99	-4,019.00
Sum	-3,163.40	-3,516.90	-4,018.84