Cold Weather Strategies
by Steve Fugate and Kai Curry and Tom Judd

Kai is the CEO of Biodiesel Blue out of MN and distributes 10's of millions of gallons of biodiesel per year.

Steve is one of the founders of the Yoderville Biodiesel Cooperative (www.ybdc.com).

Tom Judd is with Biofuel Automotive, Boulder CO (www.coloradobiodiesel.com).

The higher the temperature the BD solidifies at, the more energy. Therefore, these oils are excellent summer fuel.

Steve had mentioned that they like Soya oil which has some incentives in Iowa and is non-GMO.

There is an interesting comparison of fuels at:
http://www.biofuels.fsnet.co.uk/comparison.htm

The tank strainer can be what keeps your car from running. I have heard this before from Mike Briggs at UNH who has a recent Jetta TDI. He had added heat to his filter and possibly even a Vegtherm in-line heater. His BD gelled at the strainer so his car wouldn't run when it got real cold. He was trying to run B100 in really cold weather. I don't know that you would want to remove this strainer but you should be aware that it may be a problem.

They have looked at Power Service Trop Artic. Be aware that there is one specifically for BD that it is only available in 2 ½ gallon jugs. You have to order two jugs at $120 per jug. It was also suggested that the non-biodiesel one may work similarly if used at higher concentrations (2x-4x). These products are made for B20 so if you use them in B100 you would have to use them at 5x concentrations.

Kai said the additives add $0.10 to $0.15 per gallon.

Using gasoline in low concentrations may work. Apparently, this is discussed in some of the Mercedes owner's manuals. Don't over do it.

Steve uses B100 with additives down to 20 F.

Your methods of mixing are very important. You need to mix it before it gets cold. Kai suggested injecting the BD into the diesel at 70 F. In other words be sure the additive, diesel and BD are all 65-70 F.

Additives:
Power Service products
Primrose

Don't add these products if the fuel is less than 40 F.

Once it gels, it is not enough to just get it up above the temperature it would normally gel at. You have to warm it much more to get it into its original state. This is why prevention is far better than warming after the fact.

Kai said they start blending fuels for temperatures below 40F. You also have to consider that if you blend additives to diesel and then to BD, what is the diesel? Winter diesel can be 60% kerosene so you will get much different results with that than #2 diesel.

Ethanol based BD is better in the winter than methanol based.

You might want to look into fuel powered coolant heaters. Kai had offered to arrange a group buy since, in quantity, the prices fall dramatically. Some that you might want to consider are Espar (www.espar.com) and Blutec (Webasco) (http://www.webastoshowroom.com/blueheat), or www.zerostart.com products . You would want to power these with diesel. Tom Judd from www.coloradobiodiesel.com may also be offering a product. Drop him a line and let him know you are interested.

I think the Elsbett temp sensor triggers at 3 minutes or 65 C (149 F) so I guess you would want to be sure the sensor doesn't see that temperature or consider the effects if it does.

Emergency solutions:
Magnetic oil can heater
Emergency 911 for gelled tank
Torpedo heater under car. Or, I guess if it aggravates you too much you could just put a torpedo underneath.

They had a study called, "Qualitative Blending Data" that might be worth getting our hands on.

Tom's said that Power Service works much better than gas or kerosene.

He said due to the quantities of kerosene required to have the same effect that Power Service or similar is cheaper.

Soy BD starts to gel around 32 F.

He suggested:
>40 F Soy B100
20-40 F B50, add diesel then biodiesel
0-20 F B20
<0 F diesel

Flow (pour point)

#2 diesel 3 F
Soy BD 27 F

The way that the anti-gel products work is by making the BD crystals slippery. At the cloud point crystals start to form. As the crystals combine, the fuel forms a gel. The anti-gel makes it so that the crystals can't stick together. The crystals are typically 2-30 microns.

Strategies:
Cold filter your oil so that it is filtered at a lower temperature than it will be used at. Save the heavier stuff for summer fuel.
Don't fill tank in winter. This way you have room to add warm fuel to what's in there.
Carry an extra filter and tools to remove it possibly including a hand pump.
Use and/or carry kerosene.
Set jars of fuel outside so that you can see what might be happening in your fuel system
Consider the addition of a lift pump to help get thick fuel to the front of your car (Glacier Diesel Performance, Walbro)
Consider a tank heater
Consider insulating tank, components and/or fuel lines
Heat or insulate injector lines