PETROLEUM OILS AS ADJUVANTS

WHAT TYPES OF PRODUCTS ARE USED?
Crop Oil Concentrates are formulated for maximum dispersibility. Crop Oil Concentrates are petroleum oil based products typically containing 80-85% base oil and 15-20% of a surfactant/emulsifier. They are used to enhance the performance of herbicides, and are usually more effective than other adjuvants under conditions of low humidity and high temperature or when weeds are at the upper limit of the herbicide label. Crop Oils are formulated for "quick break" emulsions. Crop Oils are petroleum oil based products typically containing 98% base oil and 2% surfactant/emulsifier. They are used in much the same manner as crop oil concentrates, but one gallon of crop oil is required when only one quart of crop oil concentrate is used per acre. Crop Oils are normally only used with postemergence atrazine applications when tall weeds are the target. Crop Oils provide better efficacy under these conditions than crop oil concentrates do.

HOW DO YOU SELECT A QUALITY CROP OIL CONCENTRATE ADJUVANT?
BASE OIL selection is critical for adjuvant quality as well as crop safety. The level of oil refinement determines the quality of oil.

Adjuvant Effectiveness is determined by the paraffin content of the oil. Paraffin hydrocarbons are arranged in open chains (straight or branched) rather than in rings as are Naphthenes (unsaturated rings). Naphthenic oils are more phytotoxic and are sometimes used in burn down applications. A 70% paraffinic structure is considered highly refined or mineral quality oil.

Crop Safety is determined by the unsulfonated residue and the viscosity of the base oil. Phytotoxicity has been shown to increase in agricultural oils with an unsulfonated residue content below 90%. Viscosity influences how much and how long the oil stays on the leaf surface affecting the potential for an oil to burn a crop. Viscosity should be a "60-100 Second" type oil with optimum viscosity of 70 second type for relative crop safety. The optimal molecular weight of the base oil for crop safety and performance is C23.
A Surfactant/Emulsifier should have maximum surfactant load to provide adjuvant activity on the weeds. A good surfactant/emulsifier should provide:

A. Good emulsifying characteristics that allow the oil to stay in suspension within the water herbicide tank mixture.

B. Contain strong physical properties that prevent the base oil and surfactant/emulsifier from separating in the packaged container.

HOW DO CROP OIL CONCENTRATES WORK AS AN ADJUVANT?

CROP OIL CONCENTRATES have at least three ways of aiding the herbicide in controlling weeds, these are listed in order of importance:

1. Penetrate the waxy layer of cuticle on the leaf surface, providing increased penetration of the herbicide.

2. Reduce the surface tension of the spray droplet thereby insuring uniform spray coverage of the spray solution.

3. Increase the retention and the drying time of the spray solution on the leaf surface thereby increasing the amount of time the herbicide can penetrate the leaf.

ALWAYS READ THE PESTICIDE LABEL THOROUGHLY AND USE IT IN ACCORDANCE WITH ITS INFORMATION BEFORE USING AN ADJUVANT. The information contained in this brochure does not constitute a recommendation to use any pesticide in any manner contrary to the information on the pesticide label.