TECHNICAL NOTES

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Best Management Practices for Ash and Sediment Deposits on Irrigated Lands

Introduction:

Ash and soil sediments that have deposited on irrigated cropland and pasturelands may have an effect on reducing soil aeration, infiltration rates and increased soil surface pH, depending on the amount of deposition within the fields. The composition of ash/sediments that is transported and deposited on downstream fields varies from field to field and within the field. Additionally, fire suppressants used to extinguish forest fires may find their way onto irrigated lands.

These deposits may be of benefit by increasing the amount of major and minor nutrients available to the crops. During the burning of vegetation cations are released in plant available forms, such as Calcium, Magnesium, Sulfur, Potassium and Phosphorus and as a result increase soil pH. Ash deposits are a form of Carbon that will dissolve with rain or irrigation water and increase the organic carbon in the soil and be a benefit to plant nutrient availability and as energy source for beneficial soil microbes. Ash on the soil surface may also form carbon dioxide gas that is released into the atmosphere.

Cool Season Grasses:

Cool season grasses that are or will be established on these lands may require tillage to incorporate the ash and sediments to reduce these concerns. Using a Spring Tooth Harrow or light disking will incorporate the deposits and increase soil aeration and water infiltration rates. Fields that have received high amounts of ash and silt deposits may have to be re-established or re-seeded on areas where the plant population has been reduced from tillage. A small amount of deposits will not harm the pastures and additional tillage practices may not be needed.

Warm Season Grasses:

Warm season grasses grown for forage and hay that are established on these lands may require using a Spring Tooth Harrow or light disking to distribute and incorporate ash and soil sediments on the surface to increase soil aeration and water infiltration rates. High amounts of deposition will require re-establishment or re-seeding. A small amount of deposition may have a positive effect by filling in low areas within the fields where irregularities from tillage or irrigation induced erosion has occurred. If the grass or forage crop has reached sufficient height there may not be an immediate concern from reduced sunlight and in this case mechanical management practices may not be required.

Row Crops:

Row crops may be managed by using Cultivators to distribute excess sediments and ash on the surface that may increase irrigation flow rates and reduce water infiltration rates. These deposits may have a positive or negative effect on the annual crops and the decision to use additional tillage will be site specific in addition to effects to the growing crop from cultivation.

Fire Retardants:

Fire retardants contain about 85% water, 10% fertilizer (ammonia, phosphate or sulfate ions) and 5% minor ingredients (iron oxides colorant) Downstream affects are not usually an environmental concern unless under very specific conditions may cause nitrate poisoning in animals that have consumed forage crops contaminated by the retardant thru direct application during aerial fire-fighting operations. Fire suppressant foams are more than 99% water, with 1% surfactants, foaming agents, corrosion inhibitors and dispersants. These fire retardants for the most part are environmentally safe on downstream areas unless applied directly and concentrated on small closed water basin bodies where aquatic life or livestock watering may be affected by nitrate poisoning.

Conclusion:

The impacts from ash and sediments on irrigated croplands are dependent on the amounts and composition of the debris received on fields and may have beneficial or detrimental effects in maintaining a healthy crop and soil after the occurrence. The decision to implement tillage operations are dependent on the producers cropping objectives at the time of deposition and levels of treatment required.