Appendix E

Trifluralin Toxicity Analog Analysis

Since the DS lives in brackish waters, toxicity data for both freshwater and estuarine/marine fish were evaluated to assess potential direct and indirect effects of trifluralin to the DS. The most sensitive fish toxicity data from either the freshwater or the estuarine/marine taxonomic group was utilized in the risk estimation. However, no estuarine/marine fish toxicity data were available for trifluralin. These data gaps prevent the establishment of acute and chronic effects endpoints for estuarine/marine fish exposed to trifluralin.

To address this data gap, available toxicity data from chemical analogs were evaluated. The other dinitroanline herbicides that were reviewed were: benfluralin, butralin, ethalfluralin, oryzalin and pendimethalin. Structures for all chemicals are presented at the end of this Appendix. Chemicals that are structurally most similar to trifluralin are benfluralin and ethalfluralin. Acute toxicity data were available for butralin, ethalfluralin, and pendimethalin (**Table E-1**). Ethalfluralin had the most sensitive definitive endpoint (LC_{50} = 240 µg/L). This value will be used to represent acute trifluralin toxicity to estuarine/marine fish.

Since DS inhabit both freshwater and estuarine/marine habitats, the most sensitive of the acute endpoints will be used for the risk estimation and characterization. The most sensitive freshwater fish endpoint was an LC_{50} = 18.5 µg/L for bluegill sunfish (MRID 400980-01). Since this value is more sensitive than the toxicity data from other dinitroanaline herbicides for estuarine/marine fish, the freshwater fish endpoint (LC_{50} = 18.5 µg/L) will be used to assess direct effects to the DS.

Table E-1 : Summary of Acute Estuarine/Marine Fish Toxicity Endpoints for Trifluralin Analogs

ORGANISM GROUP	Trifluralin	Benfluralin[1]	Butralin[2]	Ethalfluralin[3]	Oryzalin[4]	Pendimethalin[5]
Acute estuarine/marine fish	N/A	N/A	>180 ppb Sheepshead minnow	240 ppb Sheepshead minnow	N/A	710 ppb Sheepshead minnow

[1]2004 Benfluralin Registration Eligibility Document

[2]1998 Butralin Registration Eligibility Document

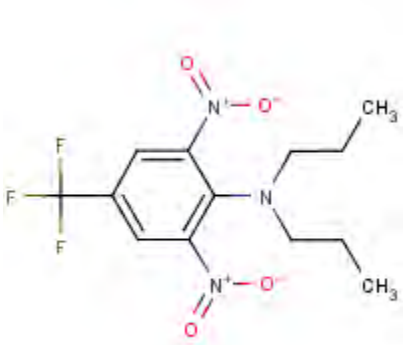
[3] Ethalfluralin Section 3 October 5, 2005 Potatoes ,Dill, Crambe, rapeseed and mustard seed

[4] Oryzalin Red -Legged Frog assessment 6/19/08

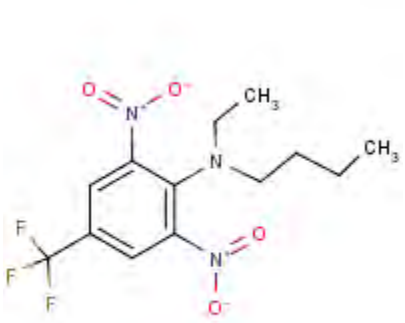
[5] Pendimethalin Section 18 control of Sanbur species on Bermuda grass pastures and hayfields in Texas

Chemical Structures of Trifluralin and Its Analogs

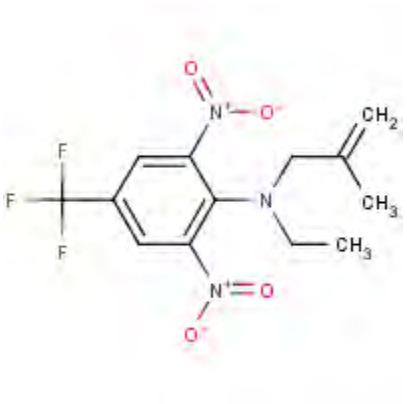
Trifluralin [ANSI:BSI:ISO]
RN: 1582-09-8



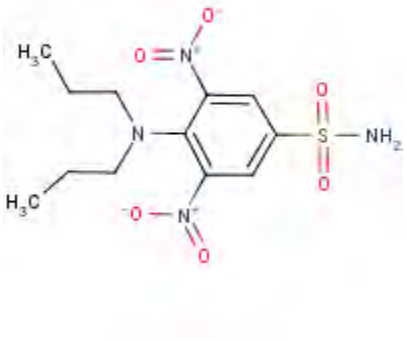
Benfluralin [BSI:ISO]
RN: 1861-40-1



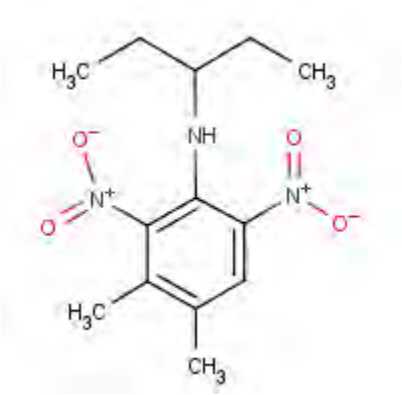
Ethalfluralin [ANSI:BSI:ISO]
RN: 55283-68-6



Oryzalin [ANSI:BSI:ISO]
RN: 19044-88-3



Pendimethalin [ANSI:BSI:ISO]
RN: 40487-42-1



Butralin [ANSI:BSI:ISO]
RN: 33629-47-9