RECOGNITION AND CONTROL OF AFRICAN RUE IN NEVADA
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Introduction
A noxious, poisonous, weed has begun to spread in two Nevada Counties. African rue (Peganum harmala L.) was originally discovered several years ago in Mineral County near Hawthorne and in Churchill County just south of Fallon. It is currently spreading in these two counties. It may occur in other locations in western Nevada, but has been unreported because most people are unfamiliar with this plant. In addition to Nevada, African rue has also been reported in California, Arizona, New Mexico, Idaho, Oregon, Washington, and western Texas. It is listed as a state noxious weed in most of these states as well as Colorado.

A farmer in New Mexico looking for a new plant to produce “Turkey Red” dye for wool yarn introduced African rue to the United States in 1928. It is not known how it spread to Nevada. The dye has been used for generations to color Persian rugs from the Middle East. African rue is native to the Mediterranean region growing from North Africa to southern Asia.

Description
This plant is a bright green, shrub that normally does not grow over one foot tall. It has succulent, thin narrow, leaves arranged alternately on stiff stems. The flowers are white with 5 petals. Seeds are produced in a 3-chambered capsule, with many small seeds in each chamber.

Ecology of African Rue
African rue is a perennial plant with deep spreading roots that can grow to over 20 feet deep in extremely dry soils. It is able to grow in very alkaline, salty soils with little rainfall. Because it is so drought tolerant, African rue can displace the native saltbushes and grasses growing in the salt-desert shrub lands of the Western U.S. It spreads primarily by seeds but will re-sprout from the roots especially if the root is cut. African rue can easily spread into disturbed lands such as the road edges, gravel pits, corrals, etc. Rangelands that are well vegetated can slow the spread of this weed. It dies back to the ground each winter and grows new stems and leaves each spring.
Poisonous properties
African rue is poisonous to cattle, sheep, horses, and humans. Other species may be vulnerable as well. The seeds, fruit and young leaves are the most poisonous plant parts. Rue is an extremely unpalatable plant and livestock consume it only when starving or under a severe mineral deficiency. The early symptoms of poisoning include weakness in the hind legs, listlessness, salivation, and anorexia. In later stages, poisoned animals suffer from stiffness, trembling, incoordination and frequent urination. Several B-carboline alkaloids appear responsible for African rue’s toxicity. They damage the gastrointestinal tract, heart and liver. There is no known antidote for African rue poisoning, but treatment recommendations include rest, clean water and high quality feed.

Very small amounts of African rue and its extracts are used as a medicine and condiment in its native areas. However, in humans, the alkaloids can cause hallucinations and severe vomiting. The alkaloids in African rue are reported to be monoamine oxidase (MAO) inhibitors. MAO inhibitors may intensify and prolong the effects of other beneficial drugs resulting in overdoses. Ingesting substances such as alcohol, coffee, meat, fat and salt may result in a severe rise in blood pressure and other dangerous side effects. The seeds and extracts of the plant are sold over the Internet. However, it is illegal to import any part of this plant into Nevada or other western states where it is listed as a noxious weed.

Controlling African Rue
No biological control agent for African rue is available in the United States. Since biological control agents take years to research, develop and release, no releases are expected in the foreseeable future.

Cultural controls are possible in theory, but are very time consuming and expensive. Preventing African Rue from becoming established by maintaining healthy native vegetation is the first step in any cultural control effort. Complete removal of any seedlings or newly established plants by continual hand pulling is also possible. Mechanical control of established populations by mowing or cultivation is typically unsuccessful because the plant readily resprouts from the crown and roots. Cultivation may spread the plant rather than control it. Continual grazing is not an option due to the poisonous properties of this plant. Burning is not recommended because the plant sprouts following disturbance.

Some herbicides show promise but more research is needed at various locations. Ongoing studies in Churchill County are an attempt to determine the most effective material, rate and application timing for control of this weed. To date, all herbicide recommendations include repeated applications over several years to achieve acceptable control. With any herbicidal treatment read and follow the label directions for the site you are treating. Desirable competing vegetation should be established after African rue plants are controlled.

Round-up or glyphosate applied at the maximum label recommended rate has been successful in killing African rue. It should be applied when the plants are in bud stage and repeated until the plant dies. Glyphosate will kill or damage desirable plants so the spray should be applied only to African rue if any desirable plants are growing nearby.

Treatments with Garlon 4 (triclopyr) or Garlon 4 mixed with Arsenal (Imazapyr) or Remedy (triclopyr) were approximately 80% effective in New Mexico. Garlon 4 and Arsenal are only approved for non-cropland sites such as right-of-ways and industrial sites. Remedy can be applied to rangelands. The materials were applied in the fall before a hard frost when plants were still actively growing. The triclopyr only treatments were mixed as a 3% solution in water, with 3% methylated, non-ionic, seed oil and 0.5-1% emulsifying agent added to the water. Mixtures of triclopyr and imazapyr contained a solution of 2 percent Garlon 4, 0.5% arsenic and the oil and emulsifier as described above.

Velpar (hexazinone) mixed at 3% in water and applied to actively growing plants has shown mixed results in Australia, with success in some instances. Initial results in Nevada do not support this treatment.
At locations designated to remain vegetation free, such as roadsides, utility pads, and equipment storage areas non-selective long lasting materials are available. Arsenal (imazapyr), Karmex (diuron) and Hyvar X or XL (bromacil) have shown promise for long-term control when applied as directed on the label. African rue is not generally mentioned specifically on the label. So select the rate listed for hard to kill perennial shrubs. All of these materials will provide total vegetation control and will result in bare ground at the high rates.

Control efforts with any herbicide listed in this publication may be inconsistent, due to the lack of long-term research results. However, at the present time they are the most successful control options available. All treatments will require more than one application to be successful. It is suggested that any control effort be scheduled for a minimum of 3 years with this hard to kill noxious weed.

*Trade names have been used to simplify information; no endorsement by Nevada Cooperative Extension is intended. As with all herbicide applications, read and follow the label directions.*

**Literature used to prepare this fact sheet**


Parker, Doug. 6-25-2001 personal communications. United States Forest Service Southwestern Regional Office, Albuquerque, New Mexico.

