Agnote

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Management of Improved Grasses on NT Floodplains

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INTRODUCTION

This Agnote deals with the management of introduced grasses on flooded areas in the Top End of the NT.

The four grasses discussed are species which are being sown or planted on pastoral properties and are regarded as improved pastures for livestock production on floodplain areas of the Top End of the NT. They are native hymenachne (*Hymenachne acutigluma*), Olive hymenachne (*H. amplexicaulis* cv Olive), para grass (*Brachiaria mutica*) and aleman grass (*Echinochloa polystachya* cv Amity). Native hymenachne and para grass are valuable pasture species on Top End properties, and have provided a significant contribution to the value of pastoral production in the NT for over 50 years. Olive hymenachne and Amity aleman grass were introduced into the Top End during the 1990s also have the potential to contribute significantly to the production of grazing livestock.

There are legitimate concerns that these grasses may create problems on native wetlands if they spread from sown paddocks into conservation areas. This Agnote outlines the management regimes of these floodplain grasses.

1. *Hymenachne acutigluma* is a native perennial aquatic or semi-aquatic grass. It is a trailing grass with thick stems which can be over 4 m long. It roots readily at the nodes. Leaves are long and broad for a grass. The plant generally has a dark green appearance. It is a deep water grass, being found on the seasonally flooded black cracking clay soils of the coastal plains and subcoastal riverine plains where flooding is over 1m deep. Hymenachne has been established by property owners by dropping seed or cuttings into water during the wet season. Native hymenachne produces low seed yields, but regeneration from seed is significant in natural stands after big floods. It also regenerates from stem sections or mats which break off and float to the water's

edge. These stems root into the mud as the water drops. More information on this species is provided in DPIFM Agnote E33 “Hymenachne”.

2. Olive hymenachne is similar in appearance to the native hymenachne, except that the leaf blades are shorter and broader. It appears to be more vigorous than the native species. The extent of its adaptation has not been determined, but it is expected to occupy the same niche of seasonally deep water on black cracking clay soils. Olive produces more viable seed of better quality than native hymenachne. More information on this species is also presented in DPIFM Agnote E33. Olive has been declared a Weed of National Significance. It is not recommended for sowing in the NT.

3. Para grass is a coarse, vigorous, trailing, hairy perennial grass. It has stout runners up to 5 m long, which branch and root readily at the nodes. Leaf blades are short and thin compared with the hymenachnes. Para grass is suited to wet areas and areas which are seasonally flooded to 1 m deep. It requires moist soil through to June each year to persist. It will not persist on some of the shallow black cracking clay soil plains which dry up before June. Para grass grows on a wide range of soil types. There are at least two ecotypes of para grass in the Top End. A naturalised line which was introduced in about 1910 does not produce viable seed and must be planted vegetatively. Para grass grown from Queensland seed produces some viable seed in the Top End. Most of the para grass in the Top End originates from the local non-seeding line. It can spread by stem sections broken off by running water or livestock that are dropped in shallow water where they can root down in mud. Vegetative spread from clumps is slow where there is competition from established native vegetation. More information is available DBIRD Agnote E30 “Para Grass”.

4. Amity aleman grass is a robust vigorous aquatic or semi-aquatic grass which produces stems up to 2.5 m long that grow upright or float on the water surface. Leaf blades are long and broad. The grass is light blue-green in colour. It is a later introduction of a naturalised floodplain grass, previously known as *Echinochloa praestans*. The extent of the adaptation of Amity is not known. It will grow on a range of soil types, and grows well on the black cracking clay soils of the Top End coastal areas. It will take deeper flooding than para grass, being reported to grow in 3 m of water, and it also survives on drier floodplains better than para grass. Aleman grass does not produce viable seed and must be planted vegetatively. More information is available in DPIFM Agnote E53 “Aleman Grass”.

WHERE TO SOW

All four grasses are specifically adapted to wet and/or seasonally flooded areas. The hymenachnes are restricted to the seasonally flooded black cracking clay soils of the coastal plains and have not performed well elsewhere. Flooding needs to be over 1m deep and extend for over six months duration for them to be productive.

Para and aleman grasses will grow on a range of soil types in wet areas where annual rainfall is over 1,000 mm.

The persistence and productivity of all four grasses is favoured by ponding, i.e. the construction of low banks to create shallow ponds which retain water longer into the dry season. In areas where annual rainfall is less than 1,000 mm, this is the only way to ensure that the grasses are persistent and productive unless they are sown or planted into a swamp or permanent water.

Sites should be carefully chosen for these grasses, particularly considering possible spread. They should not be introduced to watercourses or adjacent to other properties where running water could carry seeds or vegetative material to places where they are not wanted. If the watercourse is entirely within a pastoral property, then the pastoralist need only consider their own grazing requirements and the effects on the local wildlife, which may be both positive and negative.

The risk of the grasses spreading from established pastures can be reduced by using the non-seeding para and aleman grasses.

GRAZING

These grasses are all palatable. Grazing of new plantings should be delayed until the pasture is well rooted and developed. In the first year, grazing should be lenient. The grasses should be used solely as a dry season feed. These grasses do not stand continuous grazing. They need wet season spelling to recover root and leaf reserves.

A safe, conservative stocking rate for these floodplain areas is around 1.5 to 2 ha per beast. This may vary with the nature of the wet season which will influence how much grass is grown, when the floodplain is dry enough to graze and how long soil moisture will support the regrowth of grazed swards, and wet season application of nitrogen fertilisers. Heavier grazing pressure can be used for shorter periods.

It is good management not to graze the grasses too low in the late dry season/early wet season period as the grasses may not survive rapid flooding without leaf above the flood water level.

HAYMAKING

Good quality hay has been made from native hymenachne. Best quality in hay is usually obtained from regrowth after mowing or grazing. Hay has also been made from para grass, but it is stemmy, and crude protein levels after a season's growth are below livestock maintenance requirements. Para grass or aleman grass hay should be made from regrowth. A better quantity and quality of hay can be produced by fertilising with nitrogen late in the wet season, six to eight weeks prior to cutting. This will generally only be possible through aerial application of fertiliser.

As with grazing, the grasses should not be cut too low late in the dry season, or early in the wet season as early flooding will drown and decimate the plant population.

FIRE

All four floodplain grasses are susceptible to burning. If ungrazed during the dry season, the floodplain grasses can develop a large bulk of dry material by the end of the dry season, which presents an extreme fire risk since a fire is difficult to control on the floodplains. Dry vegetative matter which has lodged in wide cracks in the clay soil sustains the fire and makes extinguishing very difficult.

Recovery of the grasses from burning is slow, particularly if followed by flooding early in the wet season. Stands can be decimated and may take years to recover their plant population and productivity. Observations have been made that an early dry season burn may encourage the spread of para grass, but if re-burnt later in the season, it may be destroyed.

CONTROL IN NON-PASTORAL AREAS

Para grass is present in waterways and wet areas around the Top End. In most of these areas it poses no significant problem. It may also be preventing the infestation by serious weeds of the floodplains such as mimosa (*Mimosa pigra*) and senna (*Senna obtusifolia*).

It is also present in some national parks and conservation reserves. There are large areas of para grass in Kakadu National Park on the floodplains of Magela Creek and at Ubirr Rock. It was present when the pastoral leases of Mudginberri and Munmarlary were resumed to form the National Park. There are concerns that para grass and other introduced species will spread, choking out some native vegetation and eliminating native wildlife habitat in those areas. The net positive and negative effects of these introduced grasses have not been objectively studied and documented. Two of the grasses have been present on the floodplains for a considerable time without taking over. Aleman grass (*E. praestans*) was introduced over 100 years ago, and para grass about 90 years ago. Most of the spread of para grass has been by deliberate human intervention for pastoral purposes on pastoral properties.

Unwanted areas of these four grasses can be controlled by management. Management should be aimed at having the grasses short, with little leaf or reserves available when the areas they occupy are flooded in the wet season. They can be kept short by heavy grazing, frequent mowing, slashing or cutting, or by burning late in the dry season or early in the wet season. A stand which is severely abused in this manner and then flooded may be eliminated in one wet season. This strategy may not be successful in years of below average rainfall or which lack prolonged flooding.

Glyphosae (36% a.i.) at a dilution of 1:100 L can successfully control these grasses. Spray regrowth early in the season prior to flooding to make plants more susceptible to drowning.

WARNING

Pasture plants have the potential to become weeds in certain situations. To prevent that, ensure that pasture seeds and/or vegetative materials are not inadvertently transferred to adjacent properties or road sides.

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