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Setaria sphaecelata (Schumach.) M. B. Moss ex Stapf & C. E. Hubb. African bristle grass 2011 Zoya Akulova Setaria sphaecelata, a single, a perennial grass that is not native to California; naturalised in the wild. Bloom Period Family: POACEAE Genus: Setaria Wetlands: Occurs in Wetlands Communities: Wetland Name Status: Adopted by ICPN+ PLANTS For more information about the Setaria sphaecelata Proposed Citation Calflora: Information on California plants for education, research and conservation, data contributed by public and private institutions and individuals, including a Consortium of California Herbaria. [web application]. 2020. Berkeley, Calif.: The Calflora Database [a non-profit organization]. Available: (Accessed October 26, 2020). 1 Setaria sphaecelata is a tall African grass, also known as South African pigwegrass and African bristle grass. It is native to tropical and subtropical Africa and is widely grown worldwide as grass pasture and cut fodder. It has a rhizome grass producing flat, hairless, blue-green stems up to 2 m high. The inflorescence is a dense, narrow panicle with bristles, orange-tipped spikelets up to 25 inches long. Resources and credits ABCDEFGHIJKLMNOPQRSTUVWXYZ Setaria sphaecelata Setaria sphaecelata (Schumach.) Stapf & C.E. Hubb. Synonyms Setaria anceps Stapf Setaria sphaecelata (Schumach.) Stapf & C.E. Hubb. Var. anceps (Stapf) Veldkamp Setaria sphaecelata (Schumach.) Stapf & C.E. Hubb. Var. sericea (Stapf) Clayton Setaria sphaecelata (Schumach.) Stapf & C.E. Hubb. Var. splendida (Stapf) Clayton Setaria splendida Stapf Family Gramineae (South Australia) Poaceae (Queensland, New South Wales, ACT, Victoria, Tasmania, Western Australia and the Northern Territory) Common names Friar bristle grass, African bristle grass, African pigwegrass, canary seed grass, common setaria, golden bristle grass, golden cub, gold set price, golden dove grass, pigwegrass, setaria, Rhodesian grass, South African pigeon grass Esperatic tropical and South African (i.e. Cameroon, Zaire, Benin, Burkina Faso, Ivory Coast, Ghana, Guinea-Bissau, Mali, Mauritania, Nigeria, Senegal, Sierra Leone, Togo, Kenya, Tanzania, Uganda, Angola, Botswana, Namibia, South Africa and Swaziland). Cultivation This species is widely grown as grass pasture in warmer parts of Australia, especially with higher rainfall in coastal districts in the sub-tropics. There are many commercial varieties available, including Nandi, Kazungula, Narok, Solander and Splenda. Localized distribution is widespread in coastal regions of Northern and Eastern Australia and occasionally occurs in other regions. It is the most widespread and common in eastern Queensland, but can also be found in other parts of the state, in the north-east of New South Wales and in the northern parts of the Northern Territory. It is localized in other parts of New South Wales, as well as in the west of south-west, northwestern and western Australia. It is probably also naturalised in Victoria and South Australia. It is localized in the southern U.S. (i.e. California, Mississippi, Alabama, and Florida), New Zealand, and some Pacific islands (e.g. the Cook Islands and Hawaii). Habitat A from roads, waterways (i.e. coastal areas), grasslands, open forests, pastures, parks, disturbed areas and waste areas in tropical and subtropical regions of Tropical and Subtropical Australia. Occasionally it can be found in warmer temperate and semi-dry regions. Habitat A densely fluffy and long-lived (i.e. perennial) grass often grows up to 2 m high and occasionally reaches 3 m tall. Distinctive Features densely fluffy and long-lived grass often grows up to 2 m high the green or slightly bluish-green leaves have an eloqueous shape (10-50 cm long 3-17 mm wide) and are mostly hairless. the spike-like core-heads (7-17 mm wide) 50 cm long) densely grouped flower spikelets are worn by small groups. each group of spikelets is subjected to a ring of 6-15 golden bristles (4-12 mm long). Vertical (i.e. erect) flowering stems (i.e. culms) are usually green and hairless (e.g. glabrous). The green or slightly bluish-green (i.e. glaucous) leaves consist of sleeves, which surround the stem, and the scattering leaf blade. The leaf sheaths are smooth and hairless (i.e. glabrous), but where they meet the leaf blade there is a set of hairs (i.e. cilia) about 1.5 mm long. Elastic (i.e. linear) leaf blades (10-50 cm long 3-17 mm wide) are soft and mostly hairless (i.e. glabrous), with full margins and long pointed tips (i.e. acumina apices). Flowers and fruits Verrold (i.e. erect) core heads have a spike-like appearance, but in fact consist of a number of very short branches that are held tightly to the stem (i.e. spiciform panicles). These seed heads (7-50 cm long and about 8 mm wide) have a number of densely grouped flower spikes, which are grouped in small groups of 1-4. Each group of spikes is blessed with a ring of 6-15 golden bristle (i.e. involucre) (4-12 mm long) ring (i.e. involucre) subtended. Each flower has spikelets (1.25-3.5 mm long) oval (i.e. elliptical) shaped and consists of a pair of leaves (i.e. glumes) and two tiny flowers (i.e. florets). The lower flower flower has only male flower parts, while the upper flower has both male and female parts (i.e. fertile or bisexual). The fertile florets of three stamens and a purple or white two-pronged feathered stigma Flowering occurs mainly in summer. The seed (i.e. caryopsis or grain) remains in the remains of old flower spikes. When these seeds fall out of the core head, the subtending bristle is left behind. Reproduction and dispersion This species breeds only with seed. Seeds often spread the deliberate cultivation of this species as pasture and in contaminated agricultural products (e.g. feed). Wind, seed-eating (i.e. seed-eating) birds and water are scattered. Environmental Impact South African pigwegrass (Setaria sphaecelata) is considered environmental grass in Queensland, New South Wales and Western Australia. Legislation Not has been declared or deemed harmful by any state government authorities. A similar species of South African pigwegrass (Setaria pumila subsp. pallidifusca and purple pigeon grass (Setaria incassata), but these species are distinguished by the following differences: Setaria sphaecelata is a relatively robust, long-lived (i.e. perennial) grass that often reaches 2 meters tall grass. Its narrow cores are very long (7-50 cm long), its flower spikes are saturated by curls of 6-15 golden bristles. Its yellow bristles (Setaria pumila subsp. pallidifusca) are relatively small, short-lived (i.e. annual) grass, which rarely grows at a height of more than 1.3 m. Its narrow core heads are usually relatively short (1-10 cm long), its flower spikes are saturated by 6-8 golden bristles. The purple pigeongrass (Setaria incassata) is relatively robust, long-lived (i.e. perennial) grass, which occasionally reaches 2 m. Its narrow core heads are relatively long (3-30 cm long) and flower spikes are subjected to clusters of 8-10 purple bristles. South African pigwegrass (Setaria sphaecelata) is similar to some foxtailed grasses (Pennisetum spp.), including elephant grass (Pennisetum purpureum). However, the seeds of foxtailed grasses (Pennisetum spp.) shed together with refinery bristle. Dennis J. Minson, of Feed Ruminant Nutrition, 1990 Sok swards contains several feed species and this is another option for intake modified selective grazing. In general, there will be a difference in preference between species, and some tropical legumes will be almost completely rejected in spring and summer, but they will be easily eaten later in the year. Cattle grazed by Setaria sphaecelata/Macropitium atropurpureum sward selected a diet with a 10% legume diet in summer, but this increased to 62-73% in the autumn (Stobbs, 1977). The preference for legumes depends on the fertility of the soil and can be changed by applying fertilizer. The stylosanthes spp. The use of superphosphate on native grass containing 12% to 58% increased the proportion of legumes in the cattle-selected diet, although the moisture rate in the sward only doubled (McLean and his mtsai, 1981). Dennis J. Minson, Of Feed Ruminants Nutrition, 1990 Taking into account the various climatic factors that may affect CP concentration of feed, seasonal changes in CP are often cut swards will be investigated. CP concentration of moderate grasses regularly cut and fertilised (170 g/kg DM) and highest in autumn (230 g/kg DM), which is associated with an increase in the proportion of fodder leaves (Minson and his mtsai, 1960b, 1964). Similar seasonal changes in CP concentrations were found in other studies with moderate celestial forms (Woodman and others, 1927; Chestnut, 1966; Dent and Aldrich, 1968; Metson and Saunders, 1978b; Thompson and Warren, 1979) and tropical grasses Cynodon dactylon (Herrera, 1979) and Setaria sphaecelata (Bray and Hacker, 1981). In C. dactylon, the magnitude of the seasonal change in CP is affected by the amount and regularity of fertilizer Applied N, the high fertilizer N, the difference between summer and winter is much greater (Herrera, 1979). The summer low CP concentration mentioned in the previous section does not appear to have been caused by high temperatures in the summer. In studies carried out in a controlled environment, L. perenne was grown at different temperatures: Grown at 10 and 25°C, the average CP concentration of leaves was 196 and 252 g/kg respectively (Alberda, 1965). A similar increase in CP was seen due to high temperature increases in B. inermis (Smith, 1970a), L. corniculatus (Smith, 1970b), M. sativa (Smith, 1969, 1970b,c; Walgenbach and al, 1981), Melilotus officinalis (Smith, 1970b), P. pratense (Smith, 1970a), Trifolium hybridum and T. pratense (Smith, 1970b). Contrary to these results, the increase in higher temperature in a study (Deinum, 1966a) resulted in a decrease in L. perenne CP. Seasonal changes in CP concentration are likely partly due to differences in light intensity. Cp concentration of feed is reduced by high light intensity (Balthurst and Mitchell, 1958; Burton and his mts, 1959; Alberda, 1965; Deinum, 1966a); this decrease is associated with an increase in the feed production and dilution of available CP. If the feed is adequately N-fed, the high light intensity slightly increases the CP concentration of L. perenne (Alberda, 1965). Soil moisture stress has an inconsistent effect on CP concentrations in farmland (Deinum, 1966a; Walgenbach and his mts, 1981). If the period of stress is long, then both growth and N-taking decrease, which causes a decrease in the CP concentration of the feed, but in less severe situations only the increase decreases, and the CP concentration of the feed increases. Ksouri Riadh, ... Abdely Chedy, in advances of botanical research, 2010 A number of studies have attempted to link the magnitude of changes in soluble carbohydrate salinity tolerance. Parida and Das (2005) revealed that carbohydrates like sugars (glucose, fructose, sucrose and fructose) and starch accumulate in salt stress. Furthermore, Megdiche et al. (2007) proved that C. maritima plants accumulate large amounts of soluble carbohydrates and pro high salinity (400 mM NaCl). The main functions of sugars and sugar alcohols are osmoprotective, osmotic adaptation, carbon storage and radical scavenging (Messedi et al., 2006). There difference between starch and sugar accumulation in short- and long-term placement (Silva and Arrabaca, 2004). In short-term waterstress experiments, a decrease in sucrose and starch content was observed in Setaria sphaecelata, a naturally adapted C4 grass, while long-term experiments found higher levels of soluble sugar and smaller amounts of starch. Silva and Arrabaca (2004) hypothesized that the shift in metabolism towards sucrose may occur because starch synthesis and degradation are more affected than sucrose synthesis. Trehalose, a rare, non-reducing sugar, is present in several bacteria and fungi and some dehydration-tolerant higher plants (Vinocur and Altman, 2005). A variety of abiotic stresses on disafalkalid trehalose accumulate in many organisms such as osmolyte and osmoprotectant, protect membranes and proteins in cells, and reduce the aggregation of denatured proteins (Ashraf and Harris, 2004). The transgenic plants lead to a relatively moderate increase in trehalose levels with higher photosynthetic rates and a decrease in photo-oxidative damage under stress. Trehalose is thought to protect biological molecules from environmental stress (such as dehydration damage), as shown by its reversible water absorption capacity (Penna, 2003). The content of reducing and non-reducing sugars and the activity of sucrose phosphate synthase have been shown to increase under salt load, while starch-phosphorase activity decreases (Dubey and Singh, 1999). In general, sugar alcohols are divided into acyclic (e.g. mannitol) and cyclic polyols (e.g. pinitol). Polyols account for a significant percentage of total assimilated CO2 and may have a number of functions, such as compatible dissolved substances, low molecular weight chaperone and stress-induced oxygen-causing scavengers (Bohnert and others, 1995). Polyols show two indistinguishable effects: osmotic setting and osmoprotection (Parida and Das, 2005). In the osmotic setting, they act as osmolytes to facilitate the retention of water in the cytoplasm and allow for the locking of sodium in the flash or apoplast (cell wall). These osmolytes protect cell structures by interacting with membranes, protein complexes or enzymes. For example, mannitol, the sugar alcohol that accumulates in salt and water stress can alleviate abiotic stress. Transgenic wheat expressing escherichia coli mannitol-1-phosphatase gene (mtfD) was significantly more tolerant of water and salt load (Abbe and mal., 2003). Consequently, transgenic wheat crops showed an increase in biomass, plant height and secondary stems (unkos). Cyclic sugar alcohols, pinitol and ononitol accumulated in tolerant species, such as optional halophyte Mesembryanthemum crystallinum, when exposed to salinity or water scarcity (Bohnert and Jensen, 1996). Pinitol can be synthesized myoinositol is sequential catalyzed inositolmethyl transferase and ononitol ononitol inositol methyl transferase (Imt) cDNA was isolated from NaCl transcriptions and imt transgenic tobaccos in M. crystallinum (Vernon and Bohnert, 1992) and imt transgenic tobaccos (Vernon and Contract, 1993). Jeffrey B. Harborne, the comprehensive natural products chemistry, 1999Sa number of other plant compounds that do not fall into the three main categories listed above, also potentially defending against herbivores. Fluoroacetate and oxalate ion should be mentioned at least because of their significant toxicity. Fluoroacetate (CH2 FCO2) is found in dichapetalum cymosum (Dichapetalaceae), gastroliobium and oxylobium (Leguminosae) species, as well as in a number of other sources. This is very toxic to mammals, as it is incorporated into the Krebs cycle and then blocks it in the fluorocytate stage. Cattle poisoning is well known in South Africa and Australia after the animals grazed on these plants. Interestingly, some native fauna in Australia evolved together with these toxic plants and feed on them without damage. This is true of the grey kangaroo Macropus fuliginosus, although it is still not entirely clear how it can cope with the fluoroacetate poison.46 The potential risk of organic acid anion ecala depends on which cation it is associated with in the plant. Thus, calcium oxalate, which is not soluble, can be consumed relatively safely, while soluble potassium oxalate (e.g. Setaria sphaecelata) plants can be toxic.471 secondary compounds have a protective function against herbivores, they are most likely to be located where they are most easily detected by animals, namely on the surface of the leaf. Therefore, the first line of defense, especially against insect dispensers, are secondary metabolites, which are located in glandular hairs or trichomes, mainly on the upper surface. Some examples of phenolic and terpenoids that are thus found have been added in previous stages. Other examples include Juniper and Southwood.48 The second line of defense for some plants is provided by leaf wax, which can itself be an obstacle to feeding. In addition, 50% of antheratic species contain extra lipophilic secondary ingredients mixed with wax. It is likely that many of these ingredients are repellent insects. This is certainly evidence for some varieties of Sorghum that leaf wax alkans themselves are anti-nip to Locusta migratoria.49 The third line of defense in plants from insect grazing is latex production. Latex has been reported in more than 12,000 plant species, and one of its main functions seems to be to protect these plants that contain it when the herbivore. The effectiveness of latex, a viscous liquid consisting of a suspension of rubber particles, as a feeding deterrent, is often strengthened by the presence of terpenoid toxins (e.g. sesquiterpenes or diterpenes) or alkaloids. Experimental evidence of defensive role was mainly limited to studies with ants. However, Dussourd and Eisner50 that many mandibular insects, used to latex-containing plants, have to overcome latex protection with vein cutting behavior. Thus, the larvae of the monarch butterfly, Danaus plexipus, fed on the milkgrass plants, cut off the leaf vein before feeding the grass. Vein cutting blocks the flow of latex to feeding sites and means counter-adapting the insect to protect the plant. An adaptation insect, such as armyworm, Spodoptera eridania, have not learned this behavior and are repelled from feeding on latex drops. Other barriers to feeding insects and grazing mammals include physical detection of plant tissues and, in particular, the extent of lignified cell walls in the leaves. Monkeys, for example, tend to focus on young rising leaves of trees to avoid the toughness and stiffness of mature tissues. Finally, it is important to point out that the effectiveness of secondary metabolites as protective substances can be confirmed by the presence of inorganic compounds. Many grasses contain crystalline blockages, called raphides, consisting of calcium carbonate, and they are likely to limit mammalian grazing of such plants. Calcium chloride can also contribute to plant resistance. Harada et al.51 reported that calcium chloride interacts with leaf diacylglycerol and provides resistance to Nicotiana benthamiana and aphid nutrition. Resistant forms 100-100 times more calcium chloride in the leaf than susceptible varieties. Some plants that grow on certain soils are able to accumulate toxic metal ions in their tissues, usually with organic acids (citrate, oxalate) or small peptides called phytochelins with chelation. Such plants are therefore toxic to grazing, and thus will be protected from herbivores. This has been demonstrated for Nickel Collector Thlaspi montanum, which may contain up to 3000 parts per million of nickel in its tissues. Numerous Lecidopterian and grasshopper larvae, when fed these leaves or an artificial diet, nickel-containing, showed acute toxicity nickel 1000 ppm.52 Dennis J. Minson, a Feed Ruminant Diet, 1999a Na concentration of feed dry matter ranges from 0.05 to 21.3 g/kg DM averaged 2.2 g/kg DM 671 values cited in scientific literature. The frequency distribution (Figure 10.1) is distorted by 50% of all samples containing more than 1.5 g of Na/kg required by ruminants who meet the highest requirement for Na. Some ruminants require only 0.4 g Na/kg and 15% of feed samples have not reached this level.10.1. Frequency distribution of sodium concentrations in a wide range of ages. (world literature data) Part of the large change in Na concentration is related to the type of feed; grasses usually contain more Na than legumes, and within legumes temperate species contain more Na than tropical species (Figure 10.2). Half of the samples of tropical legumes weigh less than 0.4g Na/kg nem felel nek meg a kérdőzők bármilyen formájának követelményeinek a pótlás valamilyen formája nélkül.10.2. A nátriumkoncentráció frekvenciaeloszlása mérsékelt égvői és trópusi füvekben és hüvelyesekben. (a világradalom adatai) A takarmányótvényeknek két osztálya van, a Na akkumulátorok és a nem akkumulátorok (Youssef, 1989). A nátrium-áprító előgázások <2 g Na/kg-ot tartalmaznak, feltéve, hogy a talaj elegendő Na-t tartalmaz, és a K talaj nem haladja meg. A nem halmozódó előgázó előgázások mindig <2 g Na/kg-ot evens: when= grown= one= soils= high= in= na= and= the= concentration= is= almost= independent= of= the= level= of= soil= k= is= this= difference= between= na= accumulating= and= nonaccumulating= forages= is= demonstrated= in= table= 10.7= it= shows= the= range= of= na= that= can= occur= in= an= na= accumulating= forage= such= as= dactylis= glomerata= and= the= ways= fertilizer= k= can= depress= it= to= a= low= level= = this= is= an= extreme= case= caused= by= the= high= rates= of= k= applied.= a= and= under= normal= conditions= na= accumulating= forages= generally= contain= >2 g Na/kg-ot tartalmaznak, amely elegendő ahhoz, hogy megfeleljen a kérdőzők valamennyi osztályának Na követelményeinek. a 10.8. Mind a mérsékelt, mind a trópusi füvekben vannak olyan fajok, amelyek magas vagy alacsony Na koncentrációjuk, de úgy tűnik, hogy minden hüvelyes a Na. TABLE 10.7. A műtrágya káliumának hatása a takarmány nátrium-koncentrációjára (g/kg DM) a KCl alkalmazva (g/kg) 0125250500 Dactylis glomerata 9.11.61.10.4 Paspalum dilatatum 1.20.60.50.4 TABLE 10.8. Mean Sodium Concentration in Different Forage Species Sodium concentration (g/kg DM) Species Mean Range Reference Grasses Sorghum almu0.1 Trace-0.1 Saida et al. (1977) Sorghum bicolor var. sudanensis 0.1 Trace-0.1 Archer and Wheeler (1978) Agrostis tenuis 0.20.1-0.4 Sherrill (1978) Themeda triandra 0.20.1-0.2 Du Toit et al. (1934) Cynodon dactylon 0.30.1-0.9 Du Toit et al. (1934), Jones (1963a), Long et al. (1970), Perdono et al. (1977), Gonzalez and Everitt (1982) Heteropogon contortus 0.30.1-1.3 Playne (1970a), Playne and Haydock (1972), Murphy and Plasto (1973), Playne et al. (1978) Pennisetum clandestinum 0.3- Kaiser (1975), Sherrill (1978) Pennisetum purpureum 0.30.2-0.4 Long et al. (1970) Saccharum officinarum 0.3 Devernd (1979) Zea mays 0.30.2-0.3 Devernd (1979), Ando et al. (1985) Cenchrus ciliaris 0.50.1-3.1 Du Toit et al. (1934), Playne (1970a), Gonzalez and Everitt (1982) Pheum pratense 0.50.1-1.9 Coppenet and Calvez (1962), Griffith et al. (1965), Griffith and Walters (1966), Patil és Jones (1970) Festuca pratensis 0.60.2-1.8 Coppenet és Calvez (1962), Griffith és mtsai. (1965) Paspalum dilatatum 0.60.3-1.2 McNaught (1959), Sherrill (1978) Bracharia decumbens 0.80.2-5.2 Long et al. (1970), Perdono és mtsai. (1977), Lengyelország és Schnabel (1980), Youssef (1988) Digitaria polevansii 1.0 6.2-1.6 Mins on (1994) Lolium multiflorum 1.0 1.2-3.5 Griffith et al. (1965), Joyce and Brunswick Bromus unioloides 1.40.8-1.9 Rumball et al. (1972) Digitaria Digitaria <2> <2> (1984) Chloris gayana 2.00.1-7.0 Jones (1964), Long et al. (1970), Playne (1970a) Lolium perenne x L. multiflorum 2.31.6-5.1 Butler et al. (1962), Coppenet and Calvez (1962), Grace et al. (1974) Panicum maximum 2.30.3-8.0 Long et al. (1970), Minson (1975), Perdono et al. (1977), Youssef (1988) Festuca arundinacea 2.90.6-6.9 Coppenet and Calvez (1962), Griffith et al. (1965), Patil and Jones (1970) Phalaris aquatica 3.6-anglands (1965) Lolium perenne 4.21.1-8.7 McNaught (1959) Butler and his mts (1962), Coppenet and Calvez (1962), Griffith et al. (1965), Griffith and Walters (1966), Jones et al. (1967b), Patil and Jones (1970), Grace et al. (1974), Moseley and Jones (1974), Joblin and Keogh (1979) Digitaria pentzii 4.52.9-5.8 Minson (1984) Dactylis glomerata 5.10.4-10.1 McNaught (1959), Coppenet and Calvez (1962), Griffith et al. (1965), Patil and Jones (1970) Digitaria decumbens 5.73.2-8.2 Perdono et al. (1977), Poland and Schnabel (1980), Minson (1984) Panicum coloratum 8.13.1-16.5 Minson (1975) Setaria sphaecelata 8.60.5-18.0 Hacker (1974b) Cenchrus setiger 15.33.2-17.4 Playne (1970a) Legumes Neontonia wightii 20.1-0.2 Davidson et al. (1980) Macropitium atropurpureum 20.2-0.4 Playne (1970a) Stylosanthes guianensis 20.5-1.0 3 Hunter et al. (1979b) Stylosanthes humilis 40.1-1.5 Playne (1969a, 1970a), Playne and Haydock (1972), Playne and Mtsai. (1978) Medicago sativa 40.2-0.8 Jagnusch et al. (1977a), Schultz et al. (1979), Sherrill (1978) Trifolium pratense 90.2-1.6 De Groot (1963), Davies et al. (1966, 1968) Vigna unguiculata 9-Devernd (1979) Trifolium repens 1.1-3 Sherrill (1978) Trifolium subterraneum 1.5-3 Sherrill (1978) There are large differences in Na concentrations in Dactylis glomerata and Lolium perenne. (Figure 10.3). Most D. glomerata varieties contain enough Na to meet the requirements of all forms of animal husbandry. In F. pratensis, there are sufficient Na derogations to select genotypes in such a way that they can be selected at Na levels appropriate to all forms of ruminant production. In the case of temperate grasses, De Loose and Baert (1966) concluded that although some gains in Na content are expected by selecting timothy clones with the highest Na-uptake, the values will never be achieved for perennial and Italian ryegrass and tall fescue. There will always be a difference in the charge with a factor of 3-5. Figure 10.3 Sodium content of four feed species showing the lowest and highest genotypes. Griffith and his mts (1965). Authors © 1965 Tropical grasses exhibit a higher genetic variation in Na concentration than moderate belt (Table 10.9). Not only is there a larger variation, but it occurs in species where some ecotypes or varieties are very deficient in Na, for example, Chloris gayana, Digitaria milanjiana, and Setaria sphaecelata. The concentration of D. milanjiana Na linked to climatic and edaphical differences between african production areas et al., 1985). In Na, low lines come from dry regions, while Na-accumulating plants are collected from coastal areas with high precipitation. It has been claimed that these low Na concentrations are linked to genetic adaptation of soil to low K and that breeding grasses with higher Na concentrations can reduce drought tolerance. TABLE Genetic differences within the sodium species, grown in the area Sodium concentration (g/kg) Species Variety or line Mean Range Reference Bromus unioloides Chapel Hill 0-Rumball et al. (1972) N.Z. Trade 1.5-Phibes 1.9 Chloris gayana Giant 30.1-0.5 Jones (1964) Catambora 3.12.1-7.0 Digitaria milanjiana Low-Na ecotypes 40.2-4.8 Hacker et al. (1985) High-Natypes eco 7.23.012.5 Lolium perennium 62.5 01.2-2.7 Coppenet and Calvez (1962) Phalaris aquatica 3.6-anglands (1965) Lolium perenne 4.21.1-8.7 McNaught (1959) Butler and his mts (1962), Coppenet and Calvez (1962), Griffith et al. (1965), Griffith and Walters (1966), Jones et al. (1967b), Patil and Jones (1970), Grace et al. (1974), Moseley and Jones (1974), Joblin and Keogh (1979) Digitaria pentzii 4.52.9-5.8 Minson (1984) Dactylis glomerata 5.10.4-10.1 McNaught (1959), Coppenet and Calvez (1962), Griffith et al. (1965), Patil and Jones (1970) Digitaria decumbens 5.73.2-8.2 Perdono et al. (1977), Poland and Schnabel (1980), Minson (1984) Panicum coloratum 8.13.1-16.5 Minson (1975) Setaria sphaecelata 8.60.5-18.0 Hacker (1974b) Cenchrus setiger 15.33.2-17.4 Playne (1970a) Legumes Neontonia wightii 20.1-0.2 Davidson et al. (1980) Macropitium atropurpureum 20.2-0.4 Playne (1970a) Stylosanthes guianensis 20.5-1.0 3 Hunter et al. (1979b) Stylosanthes humilis 40.1-1.5 Playne (1969a, 1970a), Playne and Haydock (1972), Playne and Mtsai. (1978) Medicago sativa 40.2-0.8 Jagnusch et al. (1977a), Schultz et al. (1979), Sherrill (1978) Trifolium pratense 90.2-1.6 De Groot (1963), Davies et al. 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