Effects of NaCl and Na_2SO_4 to Xinjiang Commonly Used Lawn Grass Seed Germination Ability

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Effects of NaCl and Na_2SO_4 to Xinjiang commonly used lawn grass seed germination ability

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Introduction There are more than seven million hectares in Xinjiang of China (LU Chao-yang , 1997) , and planting lawn grass in saline soil influences the normal growth of the grass (DONG Li-hua , 2004) . Using the main salts in Xinjiang soils and Xinjiang commonly used lawn grass , we determined the germination capacity in Xinjiang Resources of Grass and Ecology Laboratory in March and April in 2006 . Findings should define salt resistance of Xinjiang commonly used lawn grass and enhance its use for lawn production .

Main experimental materials The grass seed came from the sales department of grass and engineering college of Xinjiang Agricultural University (Table 1) . NaCl (analytically pure) , Na_2SO_4 (analytically pure) ; ZF-100 seed germination box were used .

Table 1 *The table of material name .*

Material name	variety	habitat	introduction time
Lolium L .	Medalist	Canada	2006-02-25
Poa Pratensis	Balin	Denmark	2006-02-25
Festuca)	Wrangler	Denmark	2006-02-25
Trifolium repens L .	Haifa	Australia	2006-02-25
Festuca rubra L .	Boreal	Canada	2006-02-25

Experimental designs and methods Each grass was treated with NaCl or Na_2SO_4 .the levels were 0 (CK) ,0 .3% ,0 .6% ,0 .9% , 1 .2% , 1 .5% , 1 .8% , 2 .1% , 2 .4% , 2 .7% , 3 .0% , 3 .3% , 3 .6% . Each level was replicated three times . In each replicate there were 100 seeds in a culture dish and the right amount of solution of NaCl or Na_2SO_4 . All dishes were placed into a germination box at 22℃ . We observed the germination number daily .

Results and analysis

1 . White clover , In NaCl solution , the suitable germination density was 0 .3% ～ 0 .6% , the affected density was 1 .5% ～ 1. 8% , and lethal density was 2. 1% . In Na_2SO_4 solution ,the affected density of White clover was 0 .3% ～1 .5% and lethal density was 1 .8% .

2 . Tall Fescue : In NaCl solution , the suitable germination density was 0 .3% ～1 .8% , the affected density was 2. 1% ～2. 7% , lethal density was 3 .0% . In Na_2SO_4 solution ,the suitable germination density was 0 .3% ～1 .8% , the affected density was 2. 1% ～3. 3% , and lethal density was 3 .6% .

3 . Red Fescue : In NaCl solution , the affected density was 0 .3% ～2 .1% , and lethal density was 2 .4% . In Na_2SO_4 solution , the suitable germination density was 0 .2% , the affected density was 0 .3% ～1 .8% , and lethal density was 2 .2% .

4 . Perennial Ryegrass : In NaCl solution , the suitable germination density was 0 .3% ～1 .8% , the affected density was 2 .1% ～ 2 .7% , and lethal density was 3 .0% . In Na_2SO_4 solution ,the suitable germination density was 0 .3% ～1 .5% , the affected density was 1 .8% ～3 .0% , and lethal density was 3 .3% . Kentucky Bluegrass : In NaCl solution , the affected density was 0. 3% ～1 .7% and lethal density was 1 .8% . In Na_2SO_4 solution ,the suitable germination density was 0 .3% ～1 .5% , the affected density was 0 .3% ～0 .9% , and lethal density was 1 .2% .

5 . Perennial Ryegrass : NaCl and Na_2SO_4 solutions have little influence on the germination energy , next in the sequence is Kentucky Bluegrass , White clover , Tall Fescue , Red Fescue , as salt density increases , germination energy decreased for each lawn grass . For germination rate , the sequence of tolerance of salt from strong to weak was Tall Fescue＞Perennial Ryegrass＞ Red Fescue＞Kentucky Bluegrass＞White clover .

Conclusions The germination energy of lawn grass decreases as the salt density increases in NaCl and Na_2SO_4 solutions . The sequence of resistance-salt of grass from strong to weak was Tall Fescue＞ Perennial Ryegrass＞ Red Fescue＞ Kentucky Bluegrass＞White clover .

References

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