

A Study of the Weeds Associated with Forest Nursery Stocks in the Northern Iran

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Abstract

Following four years investigation and regular visits of the weed communities in the forest nurseries in northern Iran, 76 species of weeds belonging to 30 plant families were collected and identified of which 6 species had a coverage of over fifty percent. This coverage was seen in all nurseries among softwood and hardwood species. Seven species of weeds with coverage of over 50% in softwood nurseries and 10 species with over 50% coverage exclusively in the hardwood nurseries have so far been identified. Also during this study 35 species of weeds with an over 50% coverage were common between softwood and hardwood nurseries. In order to control weeds successfully, it is most important to recognize the predominant species.

In addition further 18 weed species with less than 50% coverage were identified as weed community within the study sites.

Introduction

In all northern forest nurseries, weeds were considered a serious problem. For the purpose of destroying and controlling these weeds high amount of money and labour is expended each year. Investigation showed that as a result of rapid growth and extreme competition from weeds, *Picea* spp. had 20% reduction in growth compare to hand pulled stocks, (Hagi Mir Sadeghi M. Ali 1986). In addition to direct damage from weed competition and reduction of stock as a result of hand weeding practices in nurseries, extreme damages to the root of grown stocks were seen and great percentage of seedlings were ultimately pulled out and destroyed.

There are currently 84 nurseries with total coverage of 1500 hectares through the country. Annually some 90 million seedlings are produced in the country for afforestation and landscape purposes. Among these nurseries, 28 with 692 hectares are located in northern Iran, with total production of 45 million seedlings. If the number of damages to the stands resulting from weed competition and also hand weeding of young stands is considered as 25% annually therefore approximately 12 million stands only in the northern nurseries are lost by weeds. On the other hand cost of combating weeds and hand weeding in the forest nurseries is extremely high and it is estimated that more than 35% of total costs of nurseries are used for weeding and combating weeds. Precipitation in study sites have showed variation of 1600 mm (maximum) in Shahr-posht to 650 mm (minimum) in Ghorogh nursery.

In those nurseries because of favorable climatical conditions which results in rapid growth of weeds, control and elimination of weeds were very difficult. Because of this, the number of hand pulling among the nurseries is two in a month and sometimes this figure might reach to 15 times in one growing season. Planting seeds and production of plantlets in all northern nurseries of the country were conducted in 120 cm beds and 5 rows, and for combating weeds hand weeding were used.

In order to reduce high costs of hand weeding, and combating weeds in the northern nurseries chemical techniques were applied. Weed identification and chemical control in the northern nurseries were started in 1986 as a project in Iran. Collection and identification of weeds have been satisfactorily

conducted. In regard to use of herbicides in the northern nurseries, the results have so far been optimistic.

Materials and Methods

For the purpose of identification of weeds and determination of weed communities some forest nurseries in the north of Iran have been subject of regular visits from early May till the end of October (duration of active vegetative growth) for four consecutive years. These nurseries are listed as follows:

Guilan province

1. Lakan
2. Pilambra
3. Chomarsara
4. Shanderman

Mazandaran province

1. Koludeh
2. Malach-cheshmeh
3. Pish-khaneh
4. Shahr-posht
5. Klardasht
6. Dasht-e Nazir
7. Urimelk.
8. Keshavarzi
9. Darzi-cola

Gorgan

1. Ghrogh

In the nurseries mentioned above, weed species collected and identified among softwood and hardwood species:

A. Softwood

1. Cedrus deodora
2. Cedrus atlantica
3. Cryptomeria elegans
4. Cryptomeria japonica
5. Cupressus arizonica
6. Cup. semp. var. horizontalis
7. Juniperus virginiana
8. Larix decidua
9. Picea excelsa
10. Pinus spp.
11. Pseudotsuga menziesii
12. Taxus bacata

B. Hardwood

1. Acer insigni
2. Acer laetum
3. Alnus glutinosa
4. Alnus subcordata
5. Fagus orientalis
6. Fraxinus excelsior
subsp. coriariaefolia
7. Fraxinus rotundifolia
8. Juglans regia
9. Quercus castaneifolia
10. Tilia begonifolia

To determine coverage percentage and predominant weeds in different host plants, four areas in the whole nursery were repeatedly visited and an inventory was taken from the weeds inside of the plots.

Weeds with a coverage of over 50% were determined as dominant species. This determination was based on visual counts. In every visit a form of nursery condition and the weeds were completed. At the same time weed samples which were not identifiable at the time were collected, preserved for scientific identification. Obviously less important weeds were also collected for determination as weed flora of the nurseries.

In this investigation a total of 76 weed species belonging to 30 plant families were identified as weed communities of forest nurseries of northern parts of Iran. This indicates the weed flora diversity of the nurseries. Scientific name of these weeds along with a family names and place of their establishment in various nurseries and their host plant species are given alphabetically in attached table. This table shows distribution and importance of weed species in the areas visited:

(Cont... Table 1)

Scientific name	Family	Softwood										Hardwood							
		Cedrus spp.	Cryptomeria spp.	Cupressus arizonica	Cup. semp. var. horizontalis	Juniperus virginiana	Larix decidua	Picea excelsa	Pinus spp.	Pseudotsuga menziesii	Taxus bacata	Acer spp.	Alnus spp.	Fagus orientalis	Fraxinus spp.	Juglans regia	Quercus castaneifolia	Tilia heterophylla	
71 Trifolium pratense L.	Leguminosae	+																	
72 Tripleurospermum disciforme Schultz. Bip.	Compositae												+						
73 Urtica dioica L.	Urticaceae	+											+						
74 Verbascum sinuatum L.	Scrophulariaceae				+														
75 Veronica persica Poiret.	Scrophulariaceae	+	+		+	+	+	+	+	+	+		+						
76 Xanthium spinosum L.	Compositae				+														

As the table indicates:

* 6 species (Convolvulus arvensis, Cynodon dactylon, Euphorbia chamaecys, Potentilla reptans, Solanum nigrum, Veronica persica) are dominant and cause many damage in all of the nurseries.

* 7 species (Daucus carota, Euphorbia spp., Geranium robertianum, Malva neglecta, Taraxacum officinale, Tribulus terrestris, verbascum sinuatum L.) with more than 50% coverage are denoted in coniferous nurseries.

* 10 species (Achillea wilhelmsii, Alopecurus myosuroides, Carex sylvatica, Cichorium intybus, Cuscuta spp., Mentha aquatica, Physalis alkekengi, Plantago lanceolata, Senecio vulgaris and Tripleurospermum disciforme with more than 50% coverage are collected in broadleaved nurseries.

* The species which observed with an over 50% coverage in both nurseries (softwood and hardwood) are:

1. Amaranthus retroflexus L.
2. Anchusa italica Retz.
3. Artemisia anua L.
4. Capsella bursa-pastoris Medic.
5. Cardaria draba (L.) Desv.
6. Chenopodium album L.
7. Cirsium arvense (L.) Scop.
8. Cyperus rotundus L.
9. Digitaria sanguinalis (L.) Scop.
10. Echinochloa crus-gali L. Beauv.
11. Equisetum arvense L.
12. Eragrostis barrelieri Dav.
13. Erigeron canadensis L.
14. Erodium cicutarium (L.) L'Herit.
15. Galinsoga parviflora Cav.
16. Galium aparine L.
17. Hypericum perforatum L.
18. Lactuca scarioloides Boiss.
19. Lamium amplexicaule L.
20. Malcolmia africana (L.) R.Br.
21. Paspalum distichum L.
22. Phalaris minor Retz.

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| 23. <i>Plantago major</i> L. | 30. <i>Rumex crispus</i> L. |
| 24. <i>Polygonum avicular</i> L. | 31. <i>Setaria glauca</i> (L.) P. Beauv. |
| 25. <i>Polygonum maritima</i> Vell. | 32. <i>Setaria viridis</i> (L.) P. Beauv. |
| 26. <i>Polygonum persicaria</i> L. | 33. <i>Sorghum halepense</i> (L.) Pers. |
| 27. <i>Portulaca oleracea</i> L. | 34. <i>Stellaria media</i> (L.) Cyrill. |
| 28. <i>Ranunculus arvensis</i> L. | 35. <i>Trifolium pratense</i> L. |
| 29. <i>Raphanus raphanistrum</i> L. | |

The following weeds are observed with less than 50% coverage in all nurseries:

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| 1. <i>Abrutylon theophrasti</i> Medic. | 10. <i>Rubus fruticosus</i> L. |
| 2. <i>Anagallis arvensis</i> L. | 11. <i>Salvia nemorosa</i> Crantz. |
| 3. <i>Artemisia vulgaris</i> L. | 12. <i>Sambucus ebulus</i> L. |
| 4. <i>Calystegia sepium</i> (L.) R. Br. | 13. <i>Sinapis arvensis</i> L. |
| 5. <i>Datura stramonium</i> L. | 14. <i>Sonchus asper</i> (L.) Hill. |
| 6. <i>Euphorbia helioscopia</i> L. | 15. <i>Sonchus oleraceus</i> L. Gou. |
| 7. <i>Hibiscus trionum</i> L. | 16. <i>Tragopogon graminifolius</i> DC. |
| 8. <i>Lactuca serriola</i> L. | 17. <i>Urtica dioica</i> L. |
| 9. <i>Oxalis corniculata</i> L. | 18. <i>Xanthium spinosum</i> L. |

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