UniBase: A Universal Database to View Images and Trace Pedigrees and Characteristics of Progenies

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Abstract. UniBase is a Windows-based (95, 98, NT, 2000, or XP) user-friendly software package that was developed for those who are interested in creating their own instant databases, add information to an existing databases or import data and images from Excel in a choice of languages. The software is very useful for germplasm inventory (fruit crops, vegetables, ornamentals, agronomic crops, weeds, chemicals, insects, pests, animals, etc.) and can be used in any breeding program (animal, horticulture, agronomy, etc.) to trace pedigrees and view images and characteristics of progenies. The database can be searched using various criteria and the use of several operators. An unlimited number of images can be stored for each entry and several graphic formats including BMP, JPEG, GIF, TIFF, etc., can be used. Additional information on UniBase and available data and images can be obtained from the authors.

Plant and animal breeders are often interested to study and follow the pedigree of progenies and lines that have potential as parents in plant and animal improvement. Tracing and drawing pedigrees have generally been performed manually, which is both laborious and time-consuming. Furthermore, it is more interesting to trace pedigrees while looking at the images and characteristics of selected lines. Breeders have the opportunity to implement a wide range of microcomputer software programs, such as those that analyze linkages and mutation frequencies (St. John et al., 1983), structures and genetic variations of populations (Dowling and Moore, 1984), genotype $\times$ environment interactions (Kang, 1985), and generation means (Ng, 1990), as well as those for record keeping and progeny evaluations (Bassi et al., 1990; Khanizadeh, 1990; Khanizadeh and Fanous, 1992; Khanizadeh and Prasher, 1997; Khanizadeh et al., 2000) to improve efficiency in breeding programs. However, most of these software programs are specific and do not allow the users to add a new database, change field names, import data and images, or enter the data in a chosen language.

This report describes a major modification that has been done to the previously released software (Khanizadeh, 1990; Khanizadeh and Prasher, 1997) based on the suggestions and recommendations received from the users since 1990 (Table 1).

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Table 1. Feature comparison of UniBase vs. Pedigree.

Feature	Unibase	Pedigree
Data and images included	Yes	No
Make new databases	Yes	No
Change field name using any language	Yes	No
Scan and bring images into database	Yes	No
Draw pedigree	Yes	Yes
Magnify images	Yes	No
Accept common image formats gif, jpg, bmp	Yes	Yes
Search/multiple search for items	Yes	Yes
Win 95, 98, NT, and XP compatible	Yes	Yes
Import data from Excel	Yes	No
Import images	Yes	No
The professional version can be redistributed with user's own logo and data	Yes	No
The administrator can make the data read only or give a user password	Yes	No
Multiple users can access the data simultaneously	Yes	Yes

existing data and images. Field names can easily be changed using any installed language, images and pedigrees of any horticultural crop can be viewed instantly using the pull down menu (Fig. 1), and password protection can be added to make the database a read-only program. The database can be searched using various criteria and the use of operators such as “and,” “or,” “begin with,” “equal to,” “greater than,” “less than,” and “contains” makes the search option flexible and efficient for selecting specific progenies. The program was originally designed for breeding several

Description

UniBase is a Windows-based (95, 98, NT, 2000, or XP) user-friendly software package that was developed for those who are interested in creating their own instant database. The program is partly derived from the software package Pedigree, which was developed by S. Khanizadeh in 1997. UniBase allows the user to create a new database by importing

Fig 1. Main screen capture of the UniBase Program.

horticultural fruit crops including strawberry and apple (Khanizadeh, 1990; Khanizadeh et al., 1991). Later, it was modified for use with for ornamentals and other fruit crops.

Since then, it has been used throughout Canada, the United States, and Europe by many

users. Comments and suggestions provided by previous users were incorporated into UniBase including change field name using any language, the ability to add new database, import and/or scan data and images, scan and bring the images into database or import directly from

digital camera, magnify images and protection of database (read only) using a password. Those who are presently using Pedigree (DOS, Windows) can import their data into UniBase and take advantage of the expanded features associated with the new software. There are no limitations to the number of entries that can be incorporated into a database and to the number of different databases that can be created. An unlimited number of images can be stored for each entry and several graphic formats including BMP, JPEG, GIF, TIFF, etc., can be used.

UniBase is very useful for germplasm inventory and has a unique and universal structure, which can be used for horticultural fruit crops, agronomy, classification of weeds, diseases, insects, chemicals, and animals. Some information (female and male parents, origin, breeder name, year released, fruit, plant, and disease susceptibility) is presently available on certain horticultural crops (Table 2) and is available to the user.

An option has also been added to the program that allows the user to import data and images via Excel into UniBase. The software can also be installed on a server and several users can share the information or work on different databases simultaneously. The program allows the administrator to add a password that makes the database read only (for visitors) or be fully controlled by selected users.

Additional information on UniBase and the use of different windows e.g., generating “pedigree,” “Option,” “import data,” etc., can be accessed from the authors.

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Table 2. Available data and images with UniBase program.

Database	Category	Common name	No. of entries	No. of images
Fruit	Small fruits	Blackberry	93	0
		Blueberry	114	1
		Cranberry	5	0
		Currant	128	0
		Dewberry	1	0
		Elderberry	2	0
		Gooseberry	71	0
		Mulberry	1	0
		Raspberry	338	0
		Strawberry	1053	290
	Tree fruits	Apple	3000	1800
		Apple rootstock	47	0
		Apricot	133	0
		Cherry	104	0
		Crab apple	90	0
		Peach	828	0
		Pear	295	0
		Plum	299	14
	Ornamentals	Annuals	2748	0
		Biennials	59	0
	Broadleaf	Broadleaf		
		Evergreen shrub	103	0
	Bulbs	(Alium; Anemone; Canna; Crocus; Jonquil; Jonquil–small cup; Jonquil–trumpet; Darwin tulip; Double early tulip Double hyacinth; Double Late tulip; Fosteriana tulip; French single late tulip; Freesia; Fringed tulip; Fritillaria; Gladiolus; Glory of the Snow; Grape hyacinth; Greigii tulip; Kaufmanniana tulip; Lily tulip; Parrot Tulip; Single early tulip; Single hyacinth;Single late tulip; Snowdrops; Special bulbs; Species tulip; Tassel hyacinth; Triumph tulip; Viridiflora tulip; Wood hyacinth)	371	0
		Conifers trees and shrubs	158	0
		Deciduous shrubs	142	0
		Deciduous trees	176	0
		House plants (flowering)	0	0
		House plants (foliage plants)	0	0
		Perennial	0	0
		Roses		
		Climbing roses; climbing roses–large flowers; climbing roses–ramblers; David Austin roses, English roses; Explorer roses–climbing; Explorer roses–shrub; Explorer roses–miniature; Floribunda rose; Grandiflora; Hybrid Tea; Miniature roses; Miniature roses–climbers; Old Garden; other series–shrub; Parkland; Rugosa; Shrub soses; Shrub roses/Meidiland; Species roses; Subzero roses	487	0
Poisonous plants	Poisonous plants	Poisonous plants	257	0
Tropical	Tropical fruits	Tropical fruits	248	0

Note: Some entry contains only the parentages to complete the pedigree of the others. No information is provided on the pedigree (Parentages) of the ornamental, poisonous, and tropical plants but the user can add it.