

# SECURITIES AND EXCHANGE COMMISSION

Washington, D.C. 20549

## FORM 11-K

**Annual report pursuant to Section 15(d) of the Securities Exchange Act of 1934**

**For the fiscal year ended December 31, 2003**

**Commission File Number 1-5725**

A. Full title of the plan and the address of the plan, if different from that of the issuer named below:

Quanex Corporation 401 (k) Savings Plan

B. Name of the issuer of the securities held pursuant to the plan and the address of its principal executive office:

Quanex Corporation  
1900 West Loop South, Suite 1500  
Houston, TX 77027

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REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

The Benefits Committee  
Quanex Corporation  
Houston, Texas

Re: Quanex Corporation 401(k) Savings Plan

We have audited the accompanying statements of net assets available for benefits of the Quanex Corporation 401(k) Savings Plan ("the Plan") as of December 31, 2003 and 2002, and the related statements of changes in net assets available for benefits for the years then ended. These financial statements are the responsibility of the Plan's management. Our responsibility is to express an opinion on these financial statements based on our audits.

We conducted our audits in accordance with the standards of the Public Company Accounting Oversight Board (United States). Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement. An audit includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements. An audit also includes assessing the accounting principles used and significant estimates made by management, as well as evaluating the overall financial statement presentation. We believe that our audits provide a reasonable basis for our opinion.

In our opinion, such financial statements present fairly, in all material respects, the net assets available for benefits of the Plan as of December 31, 2003 and 2002, and the changes in net assets available for benefits for the years then ended in conformity with accounting principles generally accepted in the United States of America.

Our audits were conducted for the purpose of forming an opinion on the basic financial statements taken as a whole. The accompanying supplemental schedule of assets (held at end of year) as of December 31, 2003 is presented for the purpose of additional analysis and is not a required part of the basic financial statements but is supplementary information required by the Department of Labor's Rules and Regulations for Reporting and Disclosure under the Employee Retirement Income Security Act of 1974. The supplemental schedule is the responsibility of the Plan's management. This supplemental schedule has been subjected to the auditing procedures applied in our audits of the basic financial statements and, in our opinion, are fairly stated in all material respects when considered in relation to the basic financial statements taken as a whole.

/s/ DELOITTE & TOUCHE, LLP

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DELOITTE & TOUCHE, LLP

Houston, Texas  
June 23, 2004

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**QUANEX CORPORATION**  
**QUANEX CORPORATION 401(k) SAVINGS PLAN**

**STATEMENTS OF NET ASSETS AVAILABLE FOR BENEFITS**

	DECEMBER 31,	
	2003	2002
<b>Assets:</b>		
Investments at fair value (see Note C)	\$ 67,893,612	\$ 52,525,725
Participant loans	2,252,714	1,976,331
Employee contributions receivable	290,199	285,779
Employer contributions receivable	340,380	383,691
	630,579	669,470
<b>Net assets available for benefits</b>	<b>\$ 70,776,905</b>	<b>\$ 55,171,526</b>

See notes to financial statements.

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**QUANEX CORPORATION**  
**QUANEX CORPORATION 401(k) SAVINGS PLAN**

**STATEMENTS OF CHANGES IN NET ASSETS AVAILABLE  
FOR BENEFITS**

	DECEMBER 31,	
	2003	2002
<b>Investment income:</b>		
Interest and dividends	\$ 774,881	\$ 730,304
Net appreciation (depreciation) in fair value of investments (see Note C)	10,828,940	(6,920,324)
	11,603,821	(6,190,020)
<b>Contributions:</b>		
Employer (net of forfeitures)	3,758,583	3,761,090
Employee	3,714,142	7,052,081
	7,472,725	10,813,171
<b>Interest on participant loans</b>	130,945	143,102
	19,207,491	4,766,253
<b>Benefit payments</b>	3,498,910	2,588,361
Administrative fees (see Note D)	15,840	9,629
	3,514,750	2,597,990
<b>Transfers between plans (see Note G)</b>	(87,362)	73,427
<b>Increase in net assets available for benefits</b>	15,605,379	2,241,690
<b>Net assets available for benefits:</b>		
Beginning of year	55,171,526	52,929,836
	\$ 70,776,905	\$ 55,171,526

See notes to financial statements.

**QUANEX CORPORATION**  
**QUANEX CORPORATION 401(k) SAVINGS PLAN**  
 EIN: 38-1872178; PN 017

**Schedule H, Line 4i — Schedule of Assets (Held at End of Year)**  
**December 31, 2003**

(a)	(b) Identity of issue, borrower, lessor or similar party	(c) Description of investment including maturity date, rate of interest, collateral, par, or maturity value	(d) Cost	(e) Current Value
*	Fidelity	Puritan Fund	\$ 1,207,459	\$ 1,268,018
*	Fidelity	Magellan Fund	12,487,097	12,622,322
*	Fidelity	Contrafund	7,139,108	7,799,009
*	Fidelity	Growth & Income Fund	9,394,665	10,035,615
*	Fidelity	Independence Fund	2,472,890	2,116,914
*	Fidelity	Overseas Fund	1,041,626	1,090,750
*	Fidelity	Balanced Fund	4,020,676	4,589,771
*	Fidelity	Blue Chip Fund	4,339,719	4,068,358
*	Fidelity	Asset Manager Fund	457,144	465,539
*	Fidelity	Low-Priced Stock Fund	3,779,990	4,666,211
*	Fidelity	Government Money Market Fund	9,692,238	9,692,238
	Templeton	Foreign Fund	669,657	730,023
	Neuberger & Berman	Partners Trust Fund	252,759	272,792
		Total Mutual Fund Assets	56,955,028	59,417,560
*	Quanex Corporation	Unitized common stock	1,883,147	3,219,239
*	Fidelity	Managed Income Portfolio	5,256,813	5,256,813
*	Participant loans	Loan maturing with 2—7 years, bearing interest at 5.25% to 9.50%		2,252,714
		Total Investments	\$ 64,094,988	\$ 70,146,326

\* Party-in-Interest

QUANEX CORPORATION  
401(k) SAVINGS PLAN

NOTES TO FINANCIAL STATEMENTS

YEARS ENDED DECEMBER 31, 2003 AND 2002

A. DESCRIPTION OF THE PLAN

The following description of the Quanex Corporation 401(k) Savings Plan (the "Plan"), formerly the Nichols 401(k) Savings Plan, provides only general information. Participants should refer to the Plan document for more complete information.

- (1) *General.* The Plan is a defined contribution plan which covers substantially all salaried and non-union hourly employees at the Nichols Aluminum locations and Engineered Products locations, employees of Temroc Metals, Inc., and bargaining unit employees at the Lincolnshire, Illinois plant. The Plan is a defined contribution plan that is subject to the provisions of the Employee Retirement Income Security Act of 1974 ("ERISA"). The assets of the Plan are held in trust by Fidelity Management Trust Company ("Fidelity" or the "Trustee"). The Benefits Committee (the "Committee"), appointed by the Company's Board of Directors, serves as the Plan administrator.

Effective June 1, 2002, the employees of Colonial Craft, Inc. became participants in the Plan.

- (2) *Contributions.* Participants may elect to contribute up to 50% of compensation as defined by the Plan agreement. The Bargaining unit employees at the Lincolnshire, Illinois plant are limited to a 15% contribution of compensation. The Company makes contributions on behalf of employees who have at least one year of service. The Company contribution is based on Company profits and is calculated based on a percentage of the employee's compensation.
- (3) *Participant Accounts.* Each participant's account is credited with the participant's contribution, the employer's contribution, and an allocation of investment income. Investment income allocations are based on individual participant account balances as of the end of the period in which the income is earned.
- (4) *Vesting and Forfeitures.* Participants are immediately vested in their voluntary contributions and earnings thereon. Vesting in the employer contribution is based on years of credited service. A participant is 20% vested for each year of credited service and fully vested after five years. If a participant terminates employment prior to becoming fully vested, the nonvested portion of the employer contributions are immediately forfeited by the participant and utilized to reduce future employer contributions. Amounts forfeited during 2003 and 2002 were \$92,258 and \$86,655, respectively. The amount available for use in the forfeiture account totaled \$8,123 and \$5,385 at December 31, 2003 and 2002, respectively.
- (5) *Payment of Benefits.* The Plan is intended for long-term savings but provides for early withdrawals and loan arrangements under certain conditions. Upon termination of service, a participant may elect to receive a cash lump-sum distribution equal to the amount of vested benefits in his or her account. Terminated participants with account balances of less than \$5,000 will automatically receive a lump sum distribution.
- (6) *Loans.* Loans may be granted to a participant of the Plan at the Committee's discretion. Loan terms range up to five years or seven years if used for the purchase of a primary residence. The loans bear a reasonable rate of interest established by the Committee. Interest on the loan is allocated to the borrower's participant account.

B. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

- (1) *Accounting Basis.* The financial statements of the Plan are prepared on the accrual basis of accounting in accordance with accounting principles generally accepted in the United States of America.
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- (2) *Investment Valuation.* The Plan recognizes net appreciation or depreciation in the fair value of its investments. Investments are reflected at fair value in the financial statements. Fair value of mutual fund assets is determined using a quoted net asset value. Fair value for Quanex Corporation common stock, which is listed on the New York Stock Exchange, is determined by using the last recorded sales price. The recorded value of the common/commingled trust is at face value, which is fair value.

Purchases and sales of securities are recorded on a trade-date basis. Interest income is recorded on the accrual basis. Dividends are recorded on the ex-dividend date.

Management fees and operating expenses charged to the Plan for investments in the mutual funds are deducted from income earned on a daily basis and are not separately reflected. Consequently, management fees and operating expenses are reflected as a reduction of investment return for such investments.

- (3) *Use of Estimates.* The preparation of financial statements in conformity with accounting principles generally accepted in the United States of America requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and changes therein and disclosure of contingent assets and liabilities. Actual results could differ from these estimates.
- (4) *Administrative Expenses.* The Company pays the administrative expenses of the Plan, except loan set up and carrying fees and redemption fees imposed on certain Fidelity funds.
- (5) *Payment of Benefits.* Benefit payments are recorded when paid.
- (6) *Risks and Uncertainties.* The Plan utilizes various investment instruments, including mutual funds and common stock. Investment securities, in general, are exposed to various risks, such as interest rate, credit, and overall market volatility. Due to the level of risk associated with certain investment securities, it is reasonably possible that changes in the values of investment securities will occur in the near term and that such changes could materially affect the amounts reported in the financial statements.

### C. INVESTMENTS

The following are investments that represent 5 percent or more of the Plan's net assets available for benefits.

	December 31, 2003		December 31, 2002	
	Shares	Amount	Shares	Amount
Fidelity Magellan Fund	129,142	\$ 12,622,322	126,227	\$ 9,966,875
Fidelity Contrafund	158,035	7,799,009	139,343	5,378,633
Fidelity Growth & Income Fund	281,662	10,035,615	268,765	8,146,264
Fidelity Balanced Fund	274,016	4,589,771	246,891	3,281,188
Fidelity Blue Chip Fund	102,659	4,068,358	87,340	2,789,625
Fidelity Low-Priced Stock Fund	133,397	4,666,211	108,013	2,718,693
Fidelity Government Money Market Fund	9,692,238	9,692,238	9,805,573	9,805,573
Fidelity Managed Income Portfolio	5,256,813	5,256,813	3,337,253	3,337,253

During the years ended 2003 and 2002, the Plan's investments (including gains and losses on investments bought and sold, as well as held during the year) appreciated/(depreciated) in value as follows:

	2003	2002
Mutual funds	\$ 9,906,442	\$ (7,254,878)
Quanex unitized common stock	922,498	334,554
	\$ 10,828,940	\$ (6,920,324)

D. RELATED PARTY TRANSACTIONS

Certain Plan investments are shares of mutual funds managed by Fidelity. Fidelity is the trustee as defined by the Plan and, therefore, these transactions qualify as party-in-interest transactions. Fees paid by the Plan for the investment management services amounted to \$15,840 and \$9,629 for the years ended December 31, 2003 and 2002, respectively. In addition, the Plan invests in shares of Quanex Corporation unitized common stock. Quanex Corporation is the Plan sponsor as defined by the Plan and, therefore, these transactions also qualify as party-in-interest transactions. As of December 31, 2003 and 2002, the value of Quanex Corporation unitized common stock held by the Plan was \$3,219,239 and \$2,443,656, respectively.

E. PLAN TERMINATION

Although it has not expressed any intention to do so, the Company has the right under the Plan to terminate the Plan at any time subject to the provisions set forth in ERISA. In the event of Plan termination, the assets held by the Trustee under the Plan will be valued and fully vested, and each participant will be entitled to distributions respecting his or her account.

F. FEDERAL INCOME TAX STATUS

The Plan is subject to specific rules and regulations related to employee benefit plans under the Department of Labor and the Internal Revenue Service. The Plan has received a favorable letter of tax determination dated December 16, 2002. As such, the Plan is qualified under Section 401(a) of the Internal Revenue Code (the "Code") and, as a result, the trust is exempt from federal income tax under Section 501(a) of the Code. The Company believes the Plan is currently designed and being operated in compliance with the applicable requirements of the Code. The Company believes the Plan was qualified and the related trust was tax-exempt as of the financial statement dates.

G. TRANSFER OF ASSETS

Account balances of \$(87,362) and \$38,440 were transferred between the Plan and the Quanex Corporation 401(k) Savings Plan for Hourly Employees in plan years 2003 and 2002, respectively.

Loan balances from employees of Colonial Craft, Inc. totaling \$34,987 were transferred to the Plan in 2002.

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**SIGNATURES**

The Plan. Pursuant to the requirements of the Securities Exchange Act of 1934, the trustees (or other persons who administer the employee benefit plan) have duly caused this annual report to be signed on its behalf by the undersigned hereunto duly authorized.

Quanex Corporation 401 (k) Savings Plan

Date: June 28, 2004

/s/ Ricardo Arredondo

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Ricardo Arredondo, Benefits Committee

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## INDEX TO EXHIBITS

23.1 Consent of Independent Registered Public Accounting Firm

99.1 Certification by chief executive officer and chief financial officer pursuant to Section 906 of the Sarbanes-Oxley Act of 2002

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**CONSENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM**

We consent to the incorporation by reference in Registration Statement No. 33-54081 of Quanex Corporation on Form S-8 of our report dated June 23, 2004, appearing in this Annual Report on Form 11-K of the Quanex Corporation 401 (k) Savings Plan for the year ended December 31, 2003.

/s/ DELOITTE & TOUCHE, LLP

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DELOITTE & TOUCHE, LLP

Houston, Texas

June 23, 2004

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QuickLinks

[Exhibit 23.1](#)

[CONSENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM](#)

**CERTIFICATION PURSUANT TO SECTION 906  
OF THE SARBANES-OXLEY ACT OF 2002**

We hereby certify that the accompanying Report of Quanex Corporation 401(k) Savings Plan (the "Plan") on Form 11-K for the year ended December 31, 2003 fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934 and that information contained in such Report fairly presents, in all material respects, the financial condition and results of operations of the Plan.

June 28, 2004

/s/ RAYMOND A. JEAN

/s/ TERRY M. MURPHY

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Raymond A. Jean  
*Chairman of the Board, President and  
Chief Executive Officer*

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Terry M. Murphy  
*Vice President—Finance and  
Chief Financial Officer*

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QuickLinks

[Exhibit 99.1](#)

[CERTIFICATION PURSUANT TO SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002](#)