
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, 2004

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

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

The Benefits Committee
Quanex Corporation
Houston, TX

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, 2004 and 2003, 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 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. The Plan is not required to have, nor were we engaged to perform, an audit of its internal control over financial reporting. Our audits included consideration of internal control over financial reporting as a basis for designing audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the Plan's internal control over financial reporting. Accordingly, we express no such opinion. An audit also includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements, 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, 2004 and 2003, 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 supplemental schedule of assets (held at end of year) as of December 31, 2004 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. This schedule is the responsibility of the Plan's management. Such schedule has been subjected to the auditing procedures applied in our audit of the basic 2004 financial statements and, in our opinion, is fairly stated in all material respects when considered in relation to the basic financial statements taken as a whole.

/s/ DELOITTE & TOUCHE LLP

DELOITTE & TOUCHE LLP

Houston, Texas
June 24, 2005

	DECEMBER 31,	
	2004	2003
Assets:		
Investments at fair value (see Note C)	\$ 75,967,860	\$ 67,893,612
Participant loans	2,200,554	2,252,714
Employee contributions receivable	305,824	290,199
Employer contributions receivable	308,088	340,380
	613,912	630,579
Net assets available for benefits	\$ 78,782,326	\$ 70,776,905

See notes to financial statements.

2

QUANEX CORPORATION
QUANEX CORPORATION 401(k) SAVINGS PLAN
STATEMENTS OF CHANGES IN NET ASSETS AVAILABLE
FOR BENEFITS

	DECEMBER 31,	
	2004	2003
Investment income:		
Interest and dividends	\$ 1,471,415	\$ 774,881
Net appreciation in fair value of investments (see Note C)	6,549,696	10,828,940
	8,021,111	11,603,821
Contributions:		
Employer (net of forfeitures)	3,658,796	3,758,583
Employee	3,657,743	3,714,142
	7,316,539	7,472,725
Interest on participant loans	123,995	130,945
Total additions	15,461,645	19,207,491
Benefit payments	7,486,178	3,498,910
Administrative fees (see Note D)	14,338	15,840
Total deductions	7,500,516	3,514,750
Transfers between plans (see Note G)	44,292	(87,362)
Increase in net assets available for benefits	8,005,421	15,605,379
Net assets available for benefits:		
Beginning of year	70,776,905	55,171,526
End of year	\$ 78,782,326	\$ 70,776,905

See notes to financial statements.

3

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, 2004

(a)	(b)	(c)	(d)	(e)
	Identity of issue, borrower, lessor or similar party	Description of investment including maturity date, rate of interest, collateral, par, or maturity value	Cost	Current Value
*	Fidelity	Puritan Fund	\$ 1,417,312	\$ 1,499,864
*	Fidelity	Magellan Fund	12,804,000	13,659,659
*	Fidelity	Contrafund	7,320,889	8,970,723
*	Fidelity	Growth & Income Fund	9,562,043	10,828,207
*	Fidelity	Independence Fund	2,266,729	2,184,169
*	Fidelity	Overseas Fund	1,167,249	1,346,429
*	Fidelity	Balanced Fund	4,539,392	5,353,315
*	Fidelity	Blue Chip Fund	4,079,710	4,120,938

*	Fidelity	Asset Manager Fund	421,720	440,212
*	Fidelity	Low-Priced Stock Fund	4,679,206	6,075,441
*	Fidelity	Government Money Market Fund	10,003,809	10,003,809
	Templeton	Foreign Fund	883,327	1,071,149
	Neuberger & Berman	Partners Trust Fund	464,662	537,583
		Total Mutual Fund Assets	59,610,048	66,091,498
*	Quanex Corporation	Unitized common stock	2,533,584	5,320,763
*	Fidelity	Common/Commingled trust	4,555,599	4,555,599
	Participant loans	Loan maturing within 1.5 to 7 years, bearing interest at 5.0% to 10.5%		2,200,554
		Total Investments	\$ 66,699,231	\$ 78,168,414

* Party-in-Interest

4

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

**NOTES TO FINANCIAL STATEMENTS
YEARS ENDED DECEMBER 31, 2004 AND 2003**

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 Homeshield locations (formerly Engineered Products locations), salaried employees of Temroc Metals, Inc., and bargaining unit employees at the Lincolnshire, Illinois facility. The Plan is subject to the provisions of the Employee Retirement Income Security Act of 1974 ("ERISA"). Fidelity Management Trust Company ("Fidelity" or the "Trustee") holds the assets of the Plan in trust. The Benefits Committee (the "Committee"), appointed by the Company's Board of Directors, serves as the Plan administrator.
- (2) **Contributions.** Participants may elect to reduce the current level of their compensation from 1% to 50% (15% for bargaining unit employees at the Lincolnshire, Illinois facility) by contributing on a pre-tax basis as defined by the Plan agreement. Participants may also contribute in half percentages. Company contributions are made based on a percentage of the employee's compensation for each individual with at least one year of service and vary by location as defined in the plan document.
- (3) **Participant Accounts.** Each participant's account is credited with the participant's contribution, the employer's contribution, and the participant's pro rata share of investment earnings. Investment earnings 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 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 2004 and 2003 were \$159,463 and \$92,258, respectively. The amount available for use in the forfeiture account totaled \$15,222 and \$8,123 at December 31, 2004 and 2003.
- (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 lump-sum distribution equal to the total amount of vested benefits in his or her account. Terminated participants with account balances of less than \$1,000 will automatically receive a lump sum distribution (\$5,000 before March 28, 2005).
- (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. Loans' mature within 1.5 to 7 years and bear interest at 5% to 10.5%. Interest on a participant's loan is allocated to the borrower's account.

5

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.
- (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 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 for 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 change 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 investments.

	December 31, 2004		December 31, 2003	
	Shares	Amount	Shares	Amount
Fidelity Magellan Fund	131,609	\$ 13,659,659	129,142	\$ 12,622,322
Fidelity Growth and Income Fund	283,387	10,828,207	281,662	10,035,615
Fidelity Government Money Market Fund	10,003,809	10,003,809	9,692,238	9,692,238
Fidelity Contrafund	158,102	8,970,723	158,035	7,799,009
Fidelity Low-Priced Stock Fund	150,943	6,075,441	133,397	4,666,211
Fidelity Balanced Fund	300,410	5,353,315	274,016	4,589,771
Quanex Unitized Common Stock	168,432	5,320,763	150,572	3,219,239
Fidelity Managed Income Portfolio	4,555,599	4,555,599	5,256,813	5,256,813
Fidelity Blue Chip Fund	98,800	4,120,938	102,659	4,068,358

During the years ended December 31, 2004 and 2003, the Plan's investments (including gains and losses on investments bought and sold, as well as held during the year) appreciated in value as follows:

	2004	2003
Mutual funds	\$ 4,634,731	\$ 9,906,442
Quanex unitized common stock	1,914,965	922,498
	<u>\$ 6,549,696</u>	<u>\$ 10,828,940</u>

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 \$14,338 and \$15,840 for the years ended December 31, 2004 and 2003, 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, 2004 and 2003, the value of Quanex Corporation unitized common stock held by the Plan was \$5,320,763 and \$3,219,239, 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 June 19, 2003. As such, the Plan is a qualified trust under Sections 401(a) and 401(k) of the Internal Revenue Code (the "Code") and, as a result, is exempt from federal income tax under Section 501(a) of the Code. Although the Plan has been amended since receiving the determination letter, 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 \$44,292 and \$(87,362) were transferred between the Plan and the Quanex Corporation 401(k) Savings Plan for Hourly Employees in plan years 2004 and 2003, respectively.

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 27, 2005

/s/ Terry m. Murphy
Terry M. Murphy, Benefits Committee

8

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

9

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 24, 2005, appearing in this Annual Report on Form 11-K of the Quanex Corporation 401 (k) Savings Plan for the year ended December 31, 2004.

/s/ DELOITTE & TOUCHE LLP
DELOITTE & TOUCHE LLP

Houston, Texas
June 24, 2005

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, 2004 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 27, 2005

/s/ RAYMOND A. JEAN

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

/s/ TERRY M. MURPHY

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