
SECURITIES AND EXCHANGE COMMISSION

Washington, D.C. 20549

FORM S-8

REGISTRATION STATEMENT UNDER THE SECURITIES ACT OF 1933

QUANEX CORPORATION

(Exact name of registrant as specified in its charter)

Delaware

(State or other jurisdiction of
incorporation or organization)

38-1872178

(I.R.S. Employer
Identification No.)

**1900 West Loop South, Suite 1500
Houston, Texas**

(Address of Principal Executive Offices)

77027

(Zip Code)

Quanex Corporation 1996 Employee Stock Option and Restricted Stock Plan

(Full title of the plan)

Terry M. Murphy

Quanex Corporation

1900 West Loop South, Suite 1500

Houston, Texas 77027

(Name and address of agent for service)

(713) 855-8000

(Telephone number, including area code, of agent for service)

With Copy to:

Fulbright & Jaworski L.L.P.

2200 Ross Avenue, Suite 2800

Dallas, Texas 75201-9975

(214) 855-8000

Attention: Harva R. Dockery

CALCULATION OF REGISTRATION FEE

Title of securities to be registered	Amount to be registered	Proposed maximum offering price per share ⁽²⁾	Proposed maximum aggregate offering price ⁽²⁾	Amount of registration fee
Common Stock \$.50 par value	1,200,000 shares ⁽¹⁾	\$33.085	\$39,702,000	\$3,211.90
Rights to purchase Series A Junior Participating Preferred Stock	1,200,000 ⁽¹⁾	—	—	—

(1) Represents additional shares and accompanying Rights registered for purchase under the Quanex Corporation 1996 Employee Stock Option and Restricted Stock Plan (the "Plan"). The number of shares and accompanying Rights registered hereunder does not include the 750,000 shares registered under that certain Registration Statement on Form S-8, Reg. No. 333-18267, filed with the Commission on December 18, 1996, or the 600,000 shares registered under that certain Registration Statement on Form S-8, Reg. No. 333-45624, filed with the Commission on September 12, 2000.

(2) Estimated solely for the purpose of calculating the registration fee pursuant to Rule 457(h) under the Securities Act of 1933 and based upon the average of the high and low sales price of a share of Common Stock on the New York Stock Exchange on September 9, 2003.

/s/ TERRY M. MURPHY	Vice President — Finance and Chief Financial Officer (Principal Financial Officer)	September 11, 2003
Terry M. Murphy		
/s/ RICARDO ARREDONDO	Vice President — Corporate Controller (Principal Accounting Officer)	September 11, 2003
Ricardo Arredondo		
/s/ DONALD G. BARGER		
Donald G. Barger	Director	September 11, 2003
/s/ SUSAN F. DAVIS		
Susan F. Davis	Director	September 11, 2003
/s/ RUSSELL M. FLAUM		
Russell M. Flaum	Director	September 11, 2003
/s/ MICHAEL J. SEBASTIAN		
Michael J. Sebastian	Director	September 11, 2003
/s/ VINCENT R. SCORSONE		
Vincent R. Scorsone	Director	September 11, 2003
/s/ JOSEPH J. ROSS		
Joseph J. Ross	Director	September 11, 2003

INDEX TO EXHIBITS

- 4.1 Quanex Corporation 1996 Employee Stock Option and Restricted Stock Plan, filed as Exhibit 10.19 of the Registrant's Annual Report on Form 10-K for the year ended October 31, 1996, and incorporated herein by reference.
- 4.2 Amendment to Quanex Corporation 1996 Employee Stock Option and Restricted Stock Plan, dated December 1997, filed as Exhibit 10.26 of the Registrant's Annual Report on Form 10-K for the year ended October 31, 1999, and incorporated herein by reference.
- 4.3 Amendment to Quanex Corporation 1996 Employee Stock Option and Restricted Stock Plan, dated December 9, 1999, filed as Exhibit 10.27 of the Registrant's Annual Report on Form 10-K for the year ended October 31, 1999, and incorporated herein by reference.
- 4.4 Amendment to Quanex Corporation 1996 Employee Stock Option and Restricted Stock Plan, effective February 23, 2000, filed as Exhibit 10.2 of the Registrant's Quarterly Report on Form 10-Q for the fiscal quarter ended January 31, 2000, and incorporated herein by reference.
- 4.5 Amendment to Quanex Corporation 1996 Employee Stock Option and Restricted Stock Plan, effective February 26, 2003, filed as Exhibit 10.1 of the Registrant's Quarterly Report on Form 10-Q for the fiscal quarter ended April 30, 2003, and incorporated herein by reference.
- 5.1 Opinion of Fulbright & Jaworski L.L.P.
- 23.1 Consent of Fulbright & Jaworski L.L.P. (included in Exhibit 5.1).
- 23.2 Consent of Deloitte & Touche LLP.
- 24.1 Powers of Attorney from certain members of the Board of Directors of the Registrant (contained on pages II-2 and II-3).

QuickLinks

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[Fulbright & Jaworski L.L.P. letterhead]

September 11, 2003

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

Ladies and Gentlemen:

We have acted as counsel to Quanex Corporation, a Delaware corporation (the "Company"), in connection with the registration under the Securities Act of 1933, as amended (the "Act"), of 1,200,000 shares (the "Shares") of the Company's common stock, \$.50 par value, and associated rights to purchase shares of the Company's Series A Junior Participating Preferred Stock, to be offered upon the terms and subject to the conditions set forth in the Quanex Corporation 1996 Employee Stock Option and Restricted Stock Plan, as amended (the "Plan").

In connection therewith, we have examined originals or copies, certified or otherwise identified to our satisfaction, of the Restated Certificate of Incorporation of the Company, as amended, the By-laws of the Company, as amended, the Plan, records of relevant corporate proceedings with respect to the offering of the Shares and such other documents, instruments and corporate records as we have deemed necessary or appropriate for the expression of the opinions contained herein. We also have examined the Company's Registration Statement on Form S-8 (the "Registration Statement"), to be filed with the Securities and Exchange Commission with respect to the Shares.

We have assumed the authenticity and completeness of all records, certificates and other instruments submitted to us as originals, the conformity to original documents of all records, certificates and other instruments submitted to us as copies, the authenticity and completeness of the originals of those records, certificates and other instruments submitted to us as copies and the correctness of all statements of fact contained in all records, certificates and other instruments that we have examined.

Based on the foregoing, and having regard for such legal considerations as we have deemed relevant, we are of the opinion that the Shares have been duly and validly authorized for issuance and, when issued in accordance with the terms of the Plan, will be duly and validly issued, fully paid and nonassessable.

The opinions expressed herein relate solely to, are based solely upon and are limited exclusively to the General Corporation Law of the State of Delaware and the federal laws of the United States of America, to the extent applicable.

We hereby consent to the filing of this opinion as an exhibit to the Registration Statement.

Very truly yours,

/s/ Fulbright & Jaworski L.L.P.

Fulbright & Jaworski L.L.P.

INDEPENDENT AUDITORS' CONSENT

We consent to the incorporation by reference in this Registration Statement of Quanex Corporation on Form S-8 of our report dated November 22, 2002, appearing in the Annual Report on Form 10-K of Quanex Corporation for the year ended October 31, 2002.

Deloitte & Touche LLP

Houston, Texas
September 9, 2003
